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THE UNIVERSITY OF ALBERTA

INFLUENCE OF PHYSICAL THERAPISTS' PRIOR KNOWLEDGE OF MEDICAL HISTORY ON EVALUATION OF AT-RISK INFANTS

by

© BARBARA BERYL ASHTON

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE

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DATED: July 21 19 89

ABSTRACT

The influence of knowledge of past medical history on the assessments performed by forty-one physical therapists of at-risk infants was examined using videotaped assessments of two at-risk infants; one with a high-risk medical history and one with a low-risk medical history. Physical therapists were randomly assigned to assess these videotaped infant examinations using The Movement Assessment of Infants examination under four different knowledge conditions of past medical history: high-risk infant with knowledge of actual high-risk history, high-risk infant with knowledge of false low-risk history, low-risk infant with knowledge of actual low-risk history, low-risk infant with knowledge of false high-risk history. Two way analyses of variance (actual medical history by knowledge of type of medical history) revealed a significant effect of physical therapists' knowledge of medical history for total risk scores and section risk scores for muscle tone and primitive reflexes. A significant effect of actual medical history was present for total risk scores, and section risk scores for muscle tone, primitive reflexes and automatic reactions. Physical therapists completed a questionnaire regarding their impressions of the infant's neuromotor status and the need for further evaluation and intervention. Chi-square analyses of questionnaire responses generally revealed a pattern which would be expected in relation to the Movement Assessment of Infants risk scores. The statistical significance of the difference in Movement Assessment of Infants risk scores between knowledge conditions of a high-risk history and a low-risk history was the same for the infant with high-risk and low-risk neuromotor status. The clinical significance of the total risk scores between knowledge conditions of a high-risk history and a low-

risk history was greater in the case of the infant with low-risk neuromotor status than in the case of the infant with high-risk neuromotor status. The higher mean total risk score obtained when this infant was assessed with a high-risk history raises the possibility of a false positive test result when at-risk infants with a high-risk medical history and neuromotor behavior that is within normal limits are assessed. Such false positive assessment information communicated to the parents of an infant may possibly alter their perceptions and interactions with the infant. As a result the child's self-concept may be altered and self-esteem may be lowered. Less than optimal child development may be a consequence.

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ABBREVIATIONS

MAI	Movement Assessment of Infants
AHRMH	Actual High-Risk Medical History
ALRMH	Actual Low-Risk Medical History
KHRMH	Knowledge High-Risk Medical History
KLRMH	Knowledge Low-Risk Medical History
MT	Muscle Tone
PR	Primitive Reflexes
AR	Automatic Reactions
VM	Volitional Movement

CHAPTER ONE

THE PROBLEM

A. INTRODUCTION

Physical therapists are involved extensively in the screening assessments of infants who are considered to be at-risk for developmental disabilities. Specific evaluation tools such as the Movement Assessment of Infants (Chandler et al. , 1980) or less structured evaluation procedures are used in the assessment process. These assessments involve extensive observation of voluntary movement, automatic movement reactions, primitive reflexes and an evaluation of

There is considerable variety in the movement responses and motoric maturation of normal full-term and preterm infants (Illingsworth, 1975; 1984). Although assessment tools such as the Movement Assessment of Infants include criteria for the rating of items, criteria are more specific for some items than for others. Items for which the criteria are general require considerable interpretation on the part of the physical therapist in judging performance as normal, immature or abnormal. The accuracy of infant assessment is consequently heavily dependent on knowledge of normal development and on the physical therapist's observational skills.

As screening programmes for the assessment of at-risk infants increase in number, evaluation of the assessment process and tools assumes greater importance. Evaluation should focus not only on the efficacy of these assessments in identifying infants with pathology and normal function, but also on the impact of false positive and false negative assessment results. The possible influence of expectancy effects related to physical therapists' knowledge of past medical history on

assessments of at-risk infants is unknown. Assumptions that events occurring in the perinatal period explain the neurological malfunction which is the pathological basis of cerebral palsy have been widespread since the time of Little (1862) who originally linked the presence of cerebral palsy to perinatal events. Freud (1897) challenged this assumption by speculating that abnormalities in the birth process and perinatal period were perhaps only indications of abnormal prenatal development. This speculation received little attention until recently when a number of investigations have cast doubt on the power of perinatal events to predict cerebral palsy (Kearsley, 1979; Kitchen et al. , 1987; Paneth, 1986; Paneth and Stark, 1983; Pharoah et al. , 1987; Nelson and Ellenberg, 1986; Nelson and Ellenberg, 1987; Nelson, 1988; Sameroff and Chandler, 1975; Stanley, 1987). Kearsley (1979) has cautioned those assessing infants regarding "the potential fallacy of regarding subsequent manifestations of deviant development as the natural sequelae of specific perinatal events". The evidence from these recent studies suggests that the earlier assumptions regarding the association of perinatal events with subsequent neuromotor development are largely unfounded.

It is not known to what extent pediatric physical therapists assume that a strong relationship exists between perinatal events and the occurrence of cerebral palsy. The strength of this association has traditionally been emphasized in the education of physical therapists and has been commonly accepted by clinicians. In comparison to pediatric neurologists, physical therapists displayed an increased false positive rate when assessing high-risk infants (Ellison et al. , 1982). While these increased rates might be explained by the assessment bias introduced

through the assumption that prior medical history is related to neuromotor development, little information is available to either support or reject this explanation.

B. STATEMENT OF THE PROBLEM

Are the evaluations of at-risk infants performed by physical therapists biased by physical therapists' knowledge of the infant's past medical history?

C. OBJECTIVES OF THE STUDY

GENERAL

To examine the influence of physical therapists' knowledge of prior medical history on assessments of medically high-risk and medically low- risk at-risk infants.

SPECIFIC

1. To examine the influence of knowledge of a high-risk medical history on physical therapists' assessment of high-risk infants.

2. To examine the influence of knowledge of a low-risk medical history on physical therapists' assessment of high-risk infants.

4. To examine the influence of knowledge of a low-risk medical history on physical therapists' assessments of low-risk infants.

4. To examine the influence of knowledge of a high-risk medical history on physical therapists' assessment of low-risk infants.

RESEARCH HYPOTHESIS

Null Hypothesis

Knowledge of prior medical history will not influence physical therapy evaluations of medically low-risk or medically high-risk, at-risk infants.

Alternative or Experimental Hypothesis

Prior knowledge of a high-risk medical history will influence physical therapists to evaluate a medically low-risk infant less favorably than will prior knowledge of a low-risk medical history.

Prior knowledge of a low-risk medical history will influence physical therapists to evaluate a medically high-risk infant more favorably than will prior knowledge of a high-risk medical history.

SIGNIFICANCE OF THE STUDY

This study will provide important information regarding the influence of knowledge of past medical history on the evaluation of at-risk infants by physical therapists. Expectancies related to knowledge of a high-risk medical history could result in physical therapists evaluating an infant more negatively than the infant's neuromotor status warrants (false positive result). Expectancies related to a knowledge of a low-risk medical history could result in a physical therapist evaluating an infant more favorably than the infant's neuromotor status warrants (false negative result). Studies of the influence of physical therapists' prior knowledge of past medical history on evaluations of at-risk infants have not been conducted. Inappropriate labeling of infants due to physical therapist expectancies associated with prior knowledge of a high-risk medical history is a concern. Parents who may already be anxious regarding

their child's status as a consequence of an at-risk birth may become unnecessarily worried about their infant's development. Of further concern is the possibility that this label may alter the parents' attitudes to the child and consequently the parent-child interaction and developmental processes. Possible false negative assessment results associated with physical therapist expectancies due to knowledge of a low-risk medical history are also of concern since they may result in delays in the initiation of appropriate treatment.

CHAPTER TWO

REVIEW OF THE LITERATURE

A. DEVELOPMENTAL SCREENING

The early identification of infants who are at risk for developmental problems through screening programs is seen to be valuable for two types of infants (Koegh, 1983; Leigh, 1983). First, screening may identify infants with a diagnosis such as phenylketonuria who can be treated successfully, completely preventing the future devastating consequences of the condition. Second, screening may provide identification of a condition such as cerebral palsy for which treatment is not likely to provide complete amelioration. In these cases, identification permits early treatment of affected children with the aim of attaining optimal function within the limitations of the deficit.

The identification of infants or children who are at risk for developmental problems involves some form of classification whether it be in terms of high or low-risk or by the use of a more specific diagnosis such as cerebral palsy. The controversies, advantages and disadvantages of classification have been extensively explored in Hobb's (1975) report of a United States government study titled "Issues In the Classification of Children". Advantages of labeling such as easier assess to remedial services and more appropriate expectations of the child were identified by parents of labeled children. Greater success in lobbying funding agencies and school systems for special services has also been indicated as an advantage (Hobbs, 1975). The primary disadvantages of labeling focus on the self-fulfilling prophecies which are seen to occur as a result of lowered expectations on the part of parents, teachers or other

professionals (Hobbs, 1975; Leigh, 1983). The child may internalize such lowered expectancies and develop low self-esteem.

B. EXPECTANCIES AND INTERPERSONAL PROCESSES

As part of the study of social interaction, the theoretical and experimental study of expectancy effects has received wide attention. Expectancies may arise from beliefs about demographic characteristics such as age, race or gender or knowledge of characteristics such as personality, intelligence, past actions, or past interactions with an individual (Miller and Turnbull, 1986; Snyder, 1984). Commonly held stereotyped attitudes, interpersonal beliefs and expectancies which are largely unsubstantiated but widespread, have been studied extensively (Ashmore and Delbeca, 1981). Since many of these common stereotypes have been very resistant to change, many investigators have examined the origins and the effects of expectancies on a variety of interpersonal processes (Miller and Turnbull, 1986). Interpersonal expectancies are commonplace in social interaction and are seen to play an essential role in social adaptation. To the degree that expectancies affect perceptions of reality and influence individual constructions of reality, the occurrence of maladaptive consequences is of interest and has application in a wide variety of social situations (Jones, 1986; Rothbart, 1981).

The most widely studied behavioral consequence of expectancies, the self-fulfilling prophecy, was originally described by Thomas Merton. As described by Merton a self-fulfilling prophecy is, "a false definition of the situation evoking a new behavior which makes the originally false conception come true"(Merton, 1957).

Because of its practical implications for a wide variety of social interactions, the concept of the self-fulfilling prophecy has stimulated

considerable research and debate. The idea that a perceiver, because of past knowledge of an individual, the target, develops expectancies, which in turn, lead to interaction with the target in accordance with the expectancy is central to the initiation of the self-fulfilling prophecy. The target in interpreting the actions of the perceiver may respond in a manner which is in keeping with the perceiver's expectation, thus resulting in a self-fulfilling prophecy. The predictions of the perceiver have been confirmed by the target's behavior. Further to acting in accordance with the perceiver's expectancies, a target may, as a result of interpreting his own actions make inferences about himself or herself, thus resulting in a change in self-concept. Beliefs and expectations, thus, may create their own social reality; the essential meaning of the self-fulfilling prophecy (Snyder, 1984). The designation of the perceiver and the target in many social interactions is arbitrary (Darley and Fazio, 1980). In social situations involving the self-fulfilling prophecy the designation of the perceiver is made on the basis of the participant who generally has the power to impose expectations on the other individual (Darley and Fazio, 1980).

Self-fulfilling prophecies may also be classified in terms of interaction and coaction effects (Miller and Turnbull, 1986). Interaction effects which are present when a perceiver's expectancy affects interaction with the target and the target's subsequent behavior are described much more frequently in the literature. When an expectancy is shared by a group of perceivers and independent co-actions occur, resulting in confirming behavior on the part of the target, a self-fulfilling prophecy has occurred as a result of coaction.

Numerous studies of classroom teacher expectancies regarding students as a result of prior knowledge of students' academic ability or prior performance and the resulting self-fulfilling prophecies exist in the literature. The considerable interest that has focused on this area of research is explained by the widespread and important implications that such studies have for the education of all children. In perhaps the most widely known of these studies, Rosenthal and Jacobsen, (1968) informed elementary teachers that 20% of the children in their classrooms showed unusual potential for "intellectual blooming". These children were randomly chosen and did not have any unusual intellectual ability. When examined at the end of the school year, the identified children showed significantly greater gains than the other children in these classrooms. Considerable subsequent research has been stimulated by this study, the results of which were described as the 'Pygmalian Effect' by the original investigators (Rosenthal and Jacobsen, 1968). A number of investigators have failed to replicate the results of this study (Conn et al. , 1968; Clairborn, 1969; Dusek and O'Connell, 1973; Fleming and Anttonen, 1971; Gosali and Meyen, 1970; Jose and Cody, 1971; Mendels and Flanders, 1973; O'Connell et al. , 1974; Soule, 1972; Sutherland and Goldschmidt, 1974). while others have confirmed the findings (Beez, 1970; Crano and Mellon, 1978; Meichenbaum et al. , 1969; Palardy, 1969; Seaver, 1973; Taylor, 1979; Zanna et al. , 1975). In reviewing fifteen years of research, Rosenthal and Rubin (1978) reached the conclusion that some evidence of teacher expectancy effects occurred in

Self-fulfilling prophecies have also been described in teacher-student interactions in non-traditional school settings (Eden and Shani, 1982; King, 1971). Investigations of expectancies in casual interactions

and bargaining and negotiation situations have also resulted in self-fulfilling prophecies (Farina et al. , 1968; Kelly and Stahleski, 1970B; Skrypnek and Snyder, 1982; Snyder et al. , 1977; Snyder and Swann, 1978A).

Evidence of self-fulfilling prophecies as a result of expectancies have been described in relation to developmental assessment in children. When the developmentally delayed label was assigned randomly to normal preschool children, these children performed less well on perceptual motor memory tasks presumably as a result of the expectancies of the examiners (Burdg, 1980). Field (1981) in examining the effect of examiner bias in assessing handicapped preschool children found that examiners who were familiar with the child or the child's clinical record gave lower scores on the Bayley and Stanford-Binet Scales than examiners who did not have this knowledge. Examiner familiarity presumably resulted in decreased expectations of the child and reduced attempts to elicit optimal performance on the part of the examiner resulting in a lowered level of child's performance.

In an investigation of mother-infant interaction, mothers rated full-term infants who were labeled as premature as smaller, finer featured and less cute than those labeled full-term. The infants labeled premature demonstrated less activity than those labeled full-term during the interactions which could be interpreted as a self-fulfilling prophecy (Sternand and Hildebrandt, 1986).

Evidence of self-disconfirming prophecies in target behavior has been reported less frequently in the literature although some examples are available. Perceivers who were given the expectancy of mental illness in a co-worker produced a better performance in the co-worker

than did perceivers who believed that their co-worker was psychologically normal (Farina and Ring, 1965). Perceivers lead to believe that they would interact with a 'cold' person induced more warmth in targets than did perceivers who expected warmth in targets (Bond, 1972). With a perceiver's expectancy of 'unfriendliness', targets behaved in a friendlier manner than did those targets expected to be friendly or those who were unlabeled (Ikes et al. , 1982). A self-disconfirming prophecy was also demonstrated in a study by Swann and Snyder (1980) where students expected to have low ability demonstrated high ability in learning card tricks. Self-disconfirming prophecies can also occur in contexts involving coaction as well as interaction (Miller and Turnbull, 1986).

EXPECTANCIES AND BEHAVIOR OF PERCEIVERS

The evidence of self-fulfilling effects in the literature is much more common than self-disconfirming effects. It has been assumed that self-fulfilling effects have occurred more frequently because the perceivers have acted more frequently in accordance with their expectancies. It has also been widely assumed that disconfirming effects occur as a result of perceivers acting in a manner that is not consistent with their expectations. Hilton and Darley (1985) and Miller and Turnbull (1986) suggest that the concept of the perceiver acting 'consistently' with expectations can result in confusion since it implies the perceiver will act in a manner identical with the expectancy. They argue that a perceiver need not act in an identical way to the expectancy to act in a manner which is consistent with the expectancy. As an example, a perceiver who expects a target to be unfriendly may act in a very friendly way yet still have the expectation of unfriendliness. The very friendly approach is not necessarily inconsistent with the expectation of unfriendliness.

An interaction goals perspective may be more useful in explaining the actions of perceivers than explaining these actions on the basis of the degree of consistency with expectations. For instance, from this perspective the perceiver might be very friendly to a target expected to be unfriendly since the relationship is anticipated to be long term. Conversely, if the relationship is anticipated to be very brief and is of little importance to the perceiver, he or she may act in an unfriendly manner because of an expectancy of unfriendliness. Other research has suggested that the perceiver's behavior is also affected by belief in target modifiability (Ikes et al. , 1982). As well, the perceiver's belief in target modifiability may be affected by the context in which the interaction takes place (Jones et al. , 1984).

THE RESPONSES OF TARGETS TO EXPECTANCIES

Research evidence indicates that there is not a consistent relationship between the behavior of perceivers and target responses. Some responses are more easily elicited by specific classes of behavior (Coppella, 1981). Miller and Turnbull (1986) observed that the interdependent behaviors of people often do not reflect constant patterns. They observed a tendency in behavioral science to regard targets as passive, perhaps as a result of their low power status. Accordingly, little research has been conducted regarding the resources of targets. Self-concept is an important factor that has been demonstrated to influence the response of targets to the behavior of perceivers. The degree of confidence in their self-concept has been shown to have an influence on targets' responses to the erroneous beliefs of perceivers (Swan and Ely, 1984). The type of incongruity between the target's self-concept and the concept indicated by the perceiver's behavior may determine the reaction

of the target. Targets are more likely to attempt to change a conception that is incorrect in a negative direction than one that is incorrect in a positive direction (Hilton and Darley, 1985). The consequences of disavowal may influence the target's response to the erroneous expectations of perceivers even though the target may not accept the expectation. The target may perceive an advantage in conforming to the expectation and so may conform to the expectation while not accepting it (von Baeyer et al. , 1981). Targets may also be motivated in some circumstances to resist the incorrect perceptions of others but may lack the resources or behavioral opportunity to be successful at disconfirmation (Miller and Holmes, 1975; Miller and Turnbull, 1986).

PROCESSING THE BEHAVIOR OF TARGETS

As well as the fact that expectancies may or may not be confirmed by the behavior of targets, perceivers may perceptually confirm or disconfirm their expectancies in spite of the objective evidence of the target's behavior. Several perceptual and behavioral combinations may occur in relation to the expectancy process. The target may objectively confirm the expectancies of the perceiver, and the perceiver may interpret the target's behavior as confirming the expectancy. Behavioral and perceptual confirmation have both occurred. When rats were randomly labeled as 'maze bright' or 'maze dull', Rosenthal and Fode (1963A) found that the maze bright rats out performed maze dull rats and were also perceived by the laboratory workers who held the expectancy as brighter and more likable. Students in Rosenthal and Jacobsen's (1968) study who were designated as 'bloomers' obtained significantly higher IQ scores than control students. The perception of their teachers that they were more interesting, curious, happy and had better future chances was

in keeping with their prior expectations (Rosenthal and Jacobsen, 1968) . Stern and Hildebrandt (1984) found that full-term infants who were labeled premature displayed less activity during mother-child interactions and were perceived by the mothers as smaller, less cute and less likable. Sutherland and Algozzine (1979) demonstrated that girls who were designated as learning disabled were perceived by student teachers to be less competent at a visual motor integration task than girls labeled normal. Objective indices of performance confirmed their perceptions.

Perceivers may perceptually confirm their expectancies in spite of objective ratings of the target's behavior that do not confirm expectancies, a combination of target behavioral disconfirmation and perceiver perceptual confirmation. In a study by Farina and Ring (1965) perceivers were given the expectancy that targets were either mentally ill or normal. The objective ratings of the performance of the targets labeled mentally ill were superior to those of the targets labeled normal. The perceivers, however, perceived the mentally ill targets as contributing less to the task. A number of studies have demonstrated perceptual confirmation after expectancies of performance were given prior to the viewing of videotapes or listening to audiotapes which objectively disconfirmed the expectancy. Expectancies induced by psychiatric labels have been examined using this methodology. In a study by Critchley (1979), diagnoses of schizophrenia and obsessive compulsive behavior significantly influenced the behavioral evaluations of videotapes of a normal child by nursing students. Caetano (1974) found increased diagnostic scores by psychiatrists when videotaped normal subjects were labeled as mental patients. Temerlin (1968) found a significant influence

of psychiatric diagnostic labels on the diagnostic impressions by psychiatrists, psychologists and clinical psychology students while listening to a recorded interview with a normal man.

When elementary grade school teachers were given the expectancy of learning disability prior to viewing a videotape of a normal child engaged in academic testing, they rated the child significantly more negatively than did teachers viewing the same videotape with the expectancy that the child was normal (Foster et al. , 1976).

Videotapes of the behavior of full-term infants, labeled as premature, have been used to study the expectancies related to the label of prematurity. College students and mothers of full-term infants rated videotaped behavior of full-term infants more negatively when the infant was labeled premature than when labeled full-term (Stern and Hildebrandt, 1984). Infants labeled premature were rated more negatively on all rating scales: physical appearance, strength, cognitive competence, sociability, and behavior by the college students. The premature label influenced the mothers ratings in a less generalized way. Mothers rated some areas of cognitive function, physical strength, and physical appearance more negatively. In a subsequent investigation, these authors studied the influence of the premature label on the ratings of videotapes of the behavior of full-term infants by mothers of premature infants (Stern and Hildebrandt Karraker, 1988). Mothers of preterm infants rated the infants labeled premature more negatively on yet fewer scales. Only physical strength and physical appearance were rated more negatively as a result of the premature label. The single difference between mothers of premature infants and mothers of full-term infants was their perception that preterms were weaker than full-terms. Miller and Ottinger (1986)

investigated the influence of full-term and preterm labels on college students' ratings of infant performance on the Brazelton scale and on their confidence to perform caregiving tasks. Labels did not influence their ratings on the Brazelton scale or their confidence in performing caregiving tasks; however, preterm infants were rated lower on general health status, attentiveness, size, and care difficulty. The labeling did not influence ratings on the more objective Brazelton scale while it did influence more subjective ratings. Fathers and mothers viewing videotapes of full-term infants labeled premature have shown more positive emotions to crying infants labeled full-terms than those labeled premature (Frodi et al. , 1978).

A small number of instances of perceptual confirmation without behavioral confirmation during assessments by health care professionals are available in the literature. The effect of expectancies on the recommendations by physicians for tonsillectomy in children have been described by Bakwin (1945). Following initial examination of a group of children, tonsillectomy was recommended for approximately 45% of the group. When the children who had not been recommended for surgery were re-evaluated by the same physicians approximately 45% of the group were recommended for tonsillectomy. When again the remaining children who had not been recommended for surgery were re-evaluated by the same physicians, 45% were recommended for surgery. Presumably the expectancy on the part of physicians that a proportion of any group of children would be candidates for tonsillectomy explain these results. Feinstein et al. (1960) has described occurrences of expectancies related to the knowledge of a patient history of rheumatic fever in the detection of heart murmurs. The effects of the expectancies

of physicians on their assessment of fetal heart rate by stethoscope was examined by Day et al. (1968). When comparing stethoscope auscultation to a fetal heart monitor it was found that where the fetal heart rate was above or below normal as determined by the fetal heart monitor, the physicians' auscultation tended to be reported in the normal range presumably as a result of an expectancy of normal. A similar bias in excessive recordings of blood pressures in the range just below the World Health Association cut off levels for borderline hypertension has been reported (Chapman et al. 1966).

Seldom have combinations of behavioral disconfirmation on the part of targets and perceptual disconfirmation on the part of perceivers been reported in the literature (Hilton and Darley, 1985). Instances of target behavioral confirmation combined with perceiver perceptual disconfirmation have also been rarely reported (Zanna et al. , 1975).

C. PSYCHOLOGICAL REACTIONS AND EXPECTANCIES OF PARENTS IN RELATION TO PREMATURE BIRTH AND SERIOUS ILLNESS IN INFANCY

Parents are psychologically very vulnerable in the neonatal period. Speculation that this is particularly so in the case of premature birth has been evident for some time (Prugh, 1953; Spock, 1945). Parents of premature infants have had to cope with serious medical crises early in their infant's life (Caplain et al. , 1965). Results of some investigations have suggested that parents interact differently and less positively with premature than with full-term infants (Goldberg, 1978). Less body contact, less face to face time, as well as less smiling by the parent have been noted (Field, 1979). In an investigation comparing developmental changes

in maternal interaction with term and preterm infants, mothers of two year old preterm infants demonstrated lower levels of positive content during teaching sessions and reported less involvement with the daily activities of their children than did mothers of full-term infants (Barnard et al. , 1984). Though the evidence is somewhat speculative, it appears that in some cases premature birth may continue to distort the mother's view of the child through several years of childhood (Barnard et al. , 1984; Caplain et al. , 1965; Prugh, 1953; Spock, 1945).

The impact of negative assessment information from health care professionals on the expectancies of parents regarding their child's health and development has been described. The consequent effects on the child's development and self-concept have also been postulated. Illingsworth and Illingsworth (1964 , 1984) have reported instances where unnecessary parental worry resulted from assessment information communicated in an inappropriate way by professionals. Lack of knowledge of normal developmental variations or insensitive or inadequate communication of information by professionals was found to contribute to unnecessary parental worry.

Rose et al (1960) described what appeared to be a mothering disability in mothers of children who had a history of Rh incompatibility. Interviews with the mothers of 90 children age four to five suggested that the presence of Rh incompatibility early in the child's life and the subsequent treatment had created an expectancy in the mother of future frail health in the child. In observations of the mothers' child care activities, an impression was gained of inadequate ability to nurture child development although most of these mothers had successfully reared other children.

Green and Solnet (1964) have described "a vulnerable child syndrome" in which parents come to regard a child as vulnerable to serious illness or death as a result of a serious life threatening illness early in the child's life from which the child has completely recovered. These investigators describe disturbances in psycho-social development in these children such as separation anxiety and hypochondriachial complaints as a result of overprotective or oversolicitous parenting. It was also noted that these mothers tended to restrict the activity of their children. Among predisposing factors that were thought to be related to these maternal behavior patterns were a premature birth, presence of congenital anomaly or an acquired handicap in the child. The early expectation that the child might die appeared to be related to a later expectation on the part of the parent of fear of failure and disappointment related to new developmental experiences such as separation and school achievement. This parental reaction appeared to retard child development or lead to deviant development as a result of the child's perception and acceptance of the expectation of his vulnerability. These investigators suggest that this image was transmitted to the child by the mother's fear and reservation in granting the child independence. These investigators also suggested that in some instances the expectancy that a child is vulnerable may be related to inadequate or inappropriate interpretation of medical information to parents at the time of the initial illness and recovery. In these cases the vulnerable child syndrome is seen to be iatrogenic or related to medical treatment.

In a more recent study of children perceived as vulnerable by parents, Levy (1980) has studied the increased use of medical care by parents for children perceived as vulnerable. While in some cases there

were medical grounds for children to be viewed as vulnerable, in many cases the perception appeared to be iatrogenic in origin; the result of the parents interpretation of some past comment or action by a physician. Also in some cases the connection that the parent made to a past disease created a parental expectancy of frail health.

D. PSYCHOLOGICAL REACTIONS AND EXPECTANCIES OF PARENTS IN RELATION TO FALSE POSITIVE TEST RESULTS

Expectancies related to prior knowledge of individuals may influence the perceptions of clinicians during assessment procedures that rely heavily on observation. Such influences could be associated with either false positive or false negative assessment results. False negative assessment results indicate a negative or disease free condition when the disease or condition is actually present. False positive assessment results indicate positive results or the presence of disease or pathology when disease or pathology is actually absent (Riegelman, 1981). Institution of important treatment procedures may be delayed as a result of false negative assessment results. Technical, ethical and psychological problems are associated with false positive results (Heyerdahl, 1988). From a technical perspective, false positives should be minimized by screening assessment classification criteria while an acceptable detection rate is maintained. Ethically the question of informing parents of test results and perhaps causing unnecessary anxiety presents a conflict to the clinician. The psychological impact of false positive tests has been examined in several investigations (Bodegard et al. , 1983; Fyro and Bodegard, 1987; Fyro and Bodegard, 1988; Sorenson et al. , 1984; Tymstra, 1986). Studies of neonatal screening for metabolic disorders have revealed increased parental anxiety long after the false positive

results have been corrected (Fyro and Bodegard, 1987). A high frequency of disturbed child behavior was also noted in these families. While a number of methodological problems may explain some of these results, the importance of possible negative psychological consequences due to the stress and the expectancies related to false positive results should not be ignored (Heyerdahl, 1988).

Tymstra (1986) examined the experiences of parents of children screened for congenital hypothryoidism in cases of a false positive test result. Thirty-one parents of children who had a false positive test result were interviewed regarding the parents' recollections of this experience. The way in which nursing staff explained the need for a repeat test, terms used by the nurse in explaining the need for re-testing that were not understood by the parents, the nurses' adverse emotional reaction to the repeat testing as well as the assumption by the nurse that pathology was present were all factors that increased the parents' stress in relation to re-testing. A visit to the pediatrician and confirmation of a negative test result did not relieve the anxieties of all parents. There were often remaining doubts about whether the child was really healthy particularly when the parents perceived that little explanation had been provided to them by the pediatrician. Some parents reported lingering doubts regarding the accuracy of the final negative test result. Generally the parents perceived the re-testing process as very taxing. Many of the parents assumed that their child had the disease after the initial positive or uncertain result. Adverse emotional reactions were especially evident in parents of a first child. Evidence from the interviews indicated that the suspicion of the disease affected the parents' perception of the child. The parents reported expecting the child to have future health problems.

Adverse effects on the cognitive and physical development of children as a result of the reporting of false positive test results to parents have also been investigated. Iatrogenic retardation or a syndrome of learned incompetence in children as described by Kearsley (1979) is associated with parental expectancies regarding possible future developmental problems related to an at-risk birth. The parental expectancy resulted in changes in parent child interaction which resulted in marked developmental delays in the child. The iatrogenic nature of the disorder was demonstrated in many cases by the child's developmental acceleration following intervention with the parents directed at introducing appropriate expectations of the child. In examining the implications of false positive diagnosis of cardiac disease in school children, Bergman and Stamm (1967) examined the school health records of 20,500 junior high school children in Seattle Public Schools. The records of 110 children indicated a history of cardiac disease on the basis of parental report. Consent for examination was obtained for 93 of these cases. Seventy-five of the children whose parents believed that they had some form of cardiac disease from the time of infancy showed no evidence of cardiac disease. Thirty of these children without disease had experienced long term restrictions imposed on their activity by parents.

E. LEARNED HELPLESSNESS

Evidence suggests that expectancies are important in determining behavior in situations involving learning and achievement (Dweck and Reppucci, 1973). The phenomenon of learned helplessness as originally described by Overmeier and Seligman (1967) has been applied to explore childrens' ability or inclination to persist toward achievement goals following failure experiences (Dweck, 1976; Dweck and Reppucci,

1973; Finchman and Hokoda, 1987). Learned helplessness refers to deficits which are manifested by organisms following exposure to non-contingent or uncontrollable events (Seligman and Maier, 1967). Simply stated the individual learns, as a result of non-contingent reinforcement to expect that their responses have little influence on events that occur in relation to themselves. Experience with uncontrollability results in motivational, cognitive and emotional deficits. The cognitive aspect of the deficit refers to the fact that the individual must not only experience helplessness but must expect uncontrollable events in order to exhibit helplessness. Expectancies that outcomes are uncontrollable results in retarded initiative or a motivational deficit. The emotional consequences of learned helplessness are seen as a depressed affect since results are viewed as uncontrollable. A revised conceptual model of learned helplessness emphasizes the causal attributions made by individuals for non-contingent events (Abramson et al. , 1978). The causal attributions are postulated to determine the nature, chronicity, and generality of learned helplessness deficits as well as later self-esteem. Individuals may make attributions that events are not controllable by themselves or others (universal helplessness) or may make attributions that events are not controllable by themselves but are controllable by others (personal helplessness). Internal attributions such as ability or effort may be made for events, or individuals may make external attributions for events such as luck or the actions of others. Stable attributions for outcomes such as ability or attractiveness or unstable attributions such as fatigue or effort may as well be postulated for events. When helplessness is seen to occur in a broad range of situations it is termed global. When helplessness occurs only in particular situations it is termed specific.

Internal, global, and stable attributions such as low ability are postulated as most significant in the lowering of self-esteem (Abramson et al. , 1978).

The negative change in the parent's view of their child which has been described in some studies in relation either to serious illness of infancy or to false positive test results would appear likely to change the parent's behavior and responses to the child. The child's developmental progress and potential could be interpreted inappropriately and seen less positively by the parent than the progress would warrant because of the expectancy of abnormal or delayed development. They may see what they expect to see. Consequently, the child's developmental progress may not be reinforced appropriately This non-contingent reinforcement could lead to the development of learned helplessness in the child. Non-contingent negative reinforcement from parents who have the most contact with the infant who may in fact be making developmental progress may alter the child's self-image in a negative way. Consequently beliefs or expectancies of low self-competence and a belief that failure is due to global, stable, internal factors such as low ability rather than specific, unstable, internal factors such as effort may develop in the child. The long term importance of such early experiences with this type of reinforcement for children lies in its implication for less than optimal achievement and emotional adaptation, in particular lowered self-

F. POSSIBLE EXPLANATIONS FOR PERCEPTUAL CONFIRMATION WITHOUT BEHAVIORAL CONFIRMATION AS A RESULT OF EXPECTANCY EFFECTS

Instances of perceptual confirmation without behavioral confirmation have been explained from two perspectives. In some studies it has been

suggested that the measurement instruments lacked sufficient sensitivity to measure some of the subtle behavior of targets (Miller and Turnbull, 1986). This explanation, though possible in some instances, would appear very unlikely in other situations where perceptual confirmation has occurred when the target's behavior options were very restricted. For instance, perceptual confirmation in the absence of behavioral confirmation has occurred in contexts such as the prisoners' dilemma game where the scoring system is very objective and face to face contact between the target and the perceiver has not occurred (Kelly and Staheleski, 1970 a, b).

A more plausible explanation and one that has received considerable support in the literature is that despite objective behavioral evidence, perceivers tend to perceive what they expect to perceive (Darley and Gross, 1983; Darley and Fazio, 1980; Duncan, 1976; Hastorf and Cantril, 1954; Snyder, 1984; Zadnay and Gerard, 1974). Distortions in perception appear to be a very likely explanation in studies where a self-disconfirming behavioral effect has emerged but the perceiver has interpreted the behavior as confirming the expectancy (Anderson and Bem, 1981; Bond, 1972; Farina and Ring, 1965; Hilton and Darley, 1985; Ickes et al. , 1982; Jones and Panitch, 1954; Rosenhan, 1973; Rosenthal and Jacobsen, 1968; Swan and Snyder, 1980).

A considerable number of investigations have examined memory and cognitive processes as a basis for perceptual distortions as an explanation for the origins and perpetuations of stereotyped beliefs. In social settings individuals are constantly testing hypotheses regarding the relationships between variables associated with the identity and the behavior of other individuals or groups (Hamilton, 1981; Rothbart, 1981).

Considerable evidence indicates that beliefs or expectancies influence this process by restricting or eliminating access to control data which is not in keeping with the particular hypothesis which is being tested (Hamilton, 1981; Rothbart, 1981). During the process of examining relationships between variables in natural settings there appears to be an insensitivity on the part of individuals to comparisons of differences in types of events. Instead there is a focus on events or behaviors that confirm prior expectancies. (Rothbart, 1981; Rothbart et al. , 1979). The power of social or professional roles in structuring information is also thought to be a source of bias. Individuals in particular roles may only have knowledge of a particular segment of a social or diagnostic group and as a consequence may make inappropriate deductions regarding the behavior or characteristics of the entire group (Einhorn and Hogarth, 1978; Rothbart, 1981).

In the process of hypothesis testing regarding beliefs or expectancies evidence of relevant instances in relation to expectancies is derived from memory. Memory influences beliefs regarding social variables through three interrelated processes; encoding, retrieval and judgement. Encoding, the process whereby events are summarized, categorized, and stored in memory is thought to be influenced by expectancies. A major criteria for classification and the determination of the salience of information during encoding is thought to be its utility and predictive value (Rothbart, 1981). Expectancies would appear to be an obvious determinant for actual or imagined predictive value in the encoding of information. The results of investigations which have shown increased recall of events that confirm expectancies support this speculation (Rothbart et al. , 1979). Events which are extreme instances

may be more likely to be encoded in memory. This may explain the apparent disproportionate influence of negative information or events in the formation of impressions and the general inclination to view extreme individuals as representative of a group (Rothbart, 1981). Expectancies regarding negative instances and extreme individuals would increase the likelihood of encoding related information. These same factors also influence the retrieval of information; consequently information that is the most salient to expectancies is more likely to be retrieved. Since judgement is based on the information which is stored, processed and retrieved, the data on which correlational judgements regarding social situations are made are often biased as a consequence of expectancies. The results of biased encoding, retrieval and judgement of information in humans have been described as illusory correlation or the overestimation of co-occurring events (Chapman and Chapman, 1967). Several investigations have examined and provided supportive evidence for this general tendency for incorrect estimation by observers of the degree of association between two variables (Chapman, 1967: Chapman and Chapman, 1967; Hamilton and Gifford, 1976: Hamilton and Rose, 1980; Hartsough, 1975; Starr and Katkin, 1969; Tversky and Kahneman, 1973).

Though judgement has been shown to be influenced by biased encoding and retrieval of information, instances where perceivers have demonstrated accurate encoding and retrieval of target behavior as disconfirming and yet have explained or judged the behavior in a manner which confirms the expectancy have been described (Strenka and Kleck, 1984). For instance, a level of performance which is unexpected could be explained as a chance happening (Miller and Ross, 1975). The unexpected behavior of the target may be explained by the

perceiver as having occurred due to the influence of the perceiver (Ickes et al. , 1982). Also behavior that perceivers find difficult to explain may be assumed to be due to motives of concealment on the part of targets (Jones et al. , 1984).

G. SUMMARY

Past studies have provided evidence of a stereotyped view of the behavior of premature infants. Less positive interaction between parents and premature infants than between parents and full-term infants has also been reported. Evidence is lacking regarding the long term influence of the apparent early expectancy effects of premature birth on parents, although it has been speculated that the influence may be present at least through several years of childhood. Since prematurity is a factor in the medical history of many at-risk infants this evidence is particularly relevant to the present study. Negative assessment information communicated to parents of premature infants in the neonatal period, could compound parental anxiety and possibly change parents' expectancies and alter parent-child interaction.

The occurrence of serious illness early in a child's life such as is the case in many at-risk infants appears to have a negative influence on the expectancies of some parents regarding their child's future health even when recovery from the illness is complete. Parental responses to this expectancy appear to result in inadequate facilitation of the child's development. The quality of communication between parents and medical personnel during the child's illness has been suggested to have an important impact on the parents' expectancies of the child and on parent -child interaction.

Expectancies related to clinicians' knowledge of past medical history have been examined in only one past study in which it was found that such knowledge in relation to assessment of handicapped preschool children resulted in lowered scores on the Bayley and Stanford-Binet (Field, 1981). The lowered performance of the children was interpreted as a self-fulfilling prophecy, that is the result of lowered expectancies of the examiner.

Several investigations indicate that false positive test results may also have a long term negative effect on the parents' expectancies of development for their children. Some evidence of self-fulfilling prophecies in terms of less than optimal child development was also evident in these investigations.

The possibility exists in view of evidence from past investigations that negative parental expectancies of development of their at-risk infants has a less than positive influence on infant's development. The effect of the expectancies created by a knowledge of a high-risk history on physical therapists' screening assessments of these infants could be a factor in a false positive assessment result. It would appear that the influence of such assessment information on parents' perceptions of their infant could be of considerable consequence. In some cases the assessment information could compound the already negative expectancies of the parents of such infants. In the case of at-risk infants it is often several months before the infant is reassessed. Consequently the parent may not be given any further information regarding the child's development for a significant period of time. The parent may be then left with inappropriate expectations of the infant because of the false positive test result for a considerable period of time. This could possibly influence

the child's development and result in a self-fulfilling prophecy at the time of reassessment. The long term effect of reduced expectancies on the part of parents could result in further inadequate or inappropriate reinforcement of the child's developmental progress and alterations in the child's self-concept. Infants and young children, when targets of such expectancies may be particularly vulnerable since they lack the resources necessary to attempt disconfirmation (Miller and Holmes, 1975; Miller and Turnbull, 1986).

Despite the evidence that labeling may influence future perceptions and performance of at-risk infants, information is not available regarding the relationship between possible expectancies due to knowledge of medical history and the false positive or false negative rates associated with the assessment of at-risk infants.

CHAPTER THREE

METHODOLOGY

A. SUBJECTS

1. Physical Therapists

Forty-one pediatric physical therapists from the Edmonton and Calgary area, who agreed to participate in this project, comprised the sample. Pediatric physical therapists were considered to be those physical therapists who were currently involved in pediatric practice. Therapists from rural areas were not included because of the difficulties and the expense associated with travel to Edmonton and Calgary for data collection. Random sampling was not possible because of the limited number of pediatric physical therapists available in Edmonton and Calgary. The sample of physical therapists was collected in the following manner. Approximately 30 physical therapists who were practising in pediatrics in Edmonton were contacted by the principal investigator. Since it was necessary for the physical therapists to be blinded to the actual research hypothesis, the objectives of the project were explained as the determination of inter-rater reliability of the Movement Assessment of Infants examination as well as the determination of other factors which might influence physical therapists' assessments of at-risk infants. All of those contacted agreed to participate but several could not participate on the actual day of data collection. Since the principal investigator was not personally familiar with pediatric physical therapists in Calgary, the physical therapy supervisor at Alberta Childrens' Hospital in Calgary was contacted and requested to contact pediatric physical therapists employed in that city. This individual distributed a written explanation of the project

to possible participants and collected the names of those pediatric physical therapists who were willing to participate.

It was determined that a sample size of approximately 40 physical therapists was necessary to find a statistically significant difference between groups on the Movement Assessment of Infants Assessment with alpha level set at .05 and beta level at .20. A mean difference of two risk points between the groups on the Movement Assessment of Infants Assessment was assumed to be clinically significant. This level of clinical significance was based on data collected in an earlier normative study where one standard deviation for the total Movement Assessment of Infants score was equal to 2 risk points (Hardy,

All physical therapists were required to sign an informed consent agreeing to participate in the project (Appendix A). Information regarding amount of total work experience; pediatric experience, experience with at-risk infants, Neurodevelopmental Treatment course training, Neurodevelopmental Baby Treatment course training and training and experience with the Movement Assessment of Infants examination was collected from each physical therapist. Each physical therapist was paid $50.00 as remuneration for participating in the project.

2. INFANTS

Two at-risk infants, one with a high-risk medical history and one with a low-risk medical history were used as subjects (Appendix B). These at-risk infants were selected from infants discharged from the Neonatal Intensive Care Unit at The Walter C Mackenzie Health Sciences Centre, University of Alberta, Edmonton. High and low risk status was determined on the basis of the following criteria:

LOW-RISK PRETERM CRITERIA

1. Born at less than 37 weeks gestation.
2 Received neonatal care at neonatal intensive care unit.
3 Absence of high-risk variables.

HIGH RISK CRITERIA

(May be preterm or full-term birth status)

A. RESUSCITATION

1 Immediate intubation and/or bagging with oxygen.
2 Apgar at 1 Minute < 3
3 Apgar at 5 Minute < 5

B RESPIRATORY SUPPORT

1 Mechanical ventilation and/or continuous positive airway pressure for greater than 7 days.
2 Oxygen requirement for greater than 14 days.
3 Bronchopulmonary Dysplasia.

C CENTRAL NERVOUS SYSTEM

1 Grade 111 or 1V intraventricular hemorrhage.
2 Periventricular leukomalacia.
3 Siezures plus or minus abnormal

The high-risk infant was defined as high-risk if one or more of the complications in two of the three categories of the above medical complications is present in the history.

An infant with a distinctively high-risk medical history and an infant with a distinctively low-risk medical history were chosen as experimental subjects from the infants available for assessment during the four month period immediately prior to the data collection.

B. PROCEDURES

Both infants were assessed at four months adjusted age using The Movement Assessment of Infant examination (MAI) (Appendix C).

The initial assessment of each infant was completed by a pediatric physical therapist who is considered to be an expert in the use of the Movement Assessment of Infants examination. This physical therapist has completed over 200 of these examinations while participating in research projects. The examination of each infant was videotaped using a standardized method (Appendix D). The parent or guardian of each infant signed an informed consent agreeing to allow the videotaping of their infant's examination for research purposes (Appendix A). Separate videotapes of other at-risk infants were completed for training purposes and reliability testing. The infants were identified only by an identity number to ensure anonymity of the subjects.

The Movement Assessment of Infants (MAI) (Appendix C) is a recently developed test for use in the neuromotor assessment of at-risk infants (Chandler et al. , 1980). Campbell (1981) describes the Movement Assessment of Infants as more "comprehensive in its assessment of total motor performance than any other test". The examination is designed for use with infants up to one year of age. Sixty-five items divided into four sections, muscle tone, primitive reflexes, automatic reactions and volitional movement, are evaluated. While the Movement Assessment of Infants has not been normed, a profile for normal motor behavior in four month old infants has been developed. Scores for 47 of the 65 items have been designated as either normal or questionable for an infant of four months of age. A risk point is given for each score that represents a questionable performance. Risk points for all four sections are summed to

obtain a total risk score. The remaining 18 items are considered too advanced for a four month assessment and are not included in the four month profile. The questionable or normal ratings for each item were determined by the authors on the basis of educational and clinical experience and a review of related literature.

Item reliability of The Movement Assessment of Infants has been reported as varying from poor to excellent for both inter-observer and intra-observer reliability, depending on the section of the test when the Kappa statistic was used to estimate reliability (Haley et al. , 1986). The majority of items demonstrated fair to good reliability. Reliability coefficients for total risk scores, demonstrated fair reliability while reliability coefficients for section risk scores varied from poor to good

The predictive validity of this examination has been assessed by several investigators. In a study of thirty five infants, tested at four months and at one year, Chandler et al (1980) found that if a score of more than 7 risk points was used as a criterion for a diagnosis of cerebral palsy all infants with cerebral palsy would have been correctly diagnosed. Eleven percent of the normal infants would have been incorrectly diagnosed as having cerebral palsy. Harris, Swanson, and Andrews et al (1984) in a follow-up study of 246 infants who were evaluated at four months and who had at least one follow-up evaluation at either one or two years of age found significant correlations of all Movement Assessment of Infants total risk scores with outcome measures on the Bayley Scale. Though all correlations between Movement Assessment of Infants scores at four months and outcome measures were significant, the magnitude of the actual correlation coefficients was small. Harris, (1987) in a comparison of the sensitivity and specificity of

the Movement Assessment of Infants and the Bayley Motor Scale in identifying infants with cerebral palsy found the Movement Assessment of Infants twice as sensitive as the Bayley Motor Scale in predicting cerebral palsy. Fewer " false positives " were found however with the Bayley Motor Scale. Paban and Piper (1987) found risk scores for the volitional movement and the primitive reflex sections at 4 months adjusted age to be correlated significantly with developmental status at 12 months in at-risk infants as assessed by the Griffiths Developmental Mental Scale and the Bayley Motor Scale.

The 41 pediatric physical therapists were trained in the use of the Movement Assessment of Infants by the physical therapist who conducted the initial examination of the infants. Physical therapists who participated were given a copy of The Movement Assessment of Infants manual two weeks before the training session. They were requested to read the manual at least twice prior to the training session. Training, testing, and data collection took place in two locations, at the Glenrose Rehabilitation Hospital in Edmonton and at the Alberta Childrens' Hospital in Calgary. Videotapes of the same two infants were used to test for effects of knowledge of medical history in both locations. Five additional videotaped infant examinations were used to train the therapists in the use of the examination and to assess inter-rater reliability. Each group of physical therapists received approximately five hours of training. During the training period testing for inter-rater reliability was completed both for the total risk scores and for the section risk scores for three separate infant examinations. Following the training period, the physical therapists were randomly assigned to one of four

groups. Four knowledge conditions of past medical history were then randomly assigned to these groups as indicated in table 3.1

TABLE 3.1

KNOWLEDGE CONDITIONS OF PHYSICAL THERAPISTS

KNOWLEDGE CONDITION A High-risk infant with knowledge of actual high-risk history.
KNOWLEDGE CONDITION B High-risk infant with knowledge of false low-risk history.
KNOWLEDGE CONDITION C Low-risk infant with knowledge of actual low-risk history.
KNOWLEDGE CONDITION D Low-risk infant with knowledge of false high-risk history

The distribution of physical therapists among the four knowledge-conditions is shown in table 3.2.

TABLE 3.2

ASSIGNMENT OF PHYSICAL THERAPISTS TO KNOWLEDGE CONDITIONS

Knowledge Condition	Edmonton	Calgary
A	5	5
B	6	4
C	6	4
D	6	5

Each group of physical therapists viewed one videotaped infant under the assigned knowledge condition and completed the Movement Assessment of Infants for that infant.

Videotapes of infant evaluations rather than actual independent evaluations by the physical therapists were used in this study to eliminate the possibility of actual variations in the infants' behaviors and responses that could occur over repeated examinations. Variations in behavior and responses between examinations are especially likely in very young infants. When examinations take place immediately one after the other, infant fatigue may alter the infant's responses from the initial to subsequent evaluations. The inconvenience to the infants' parents of attending more than one examination was also eliminated by the use of videotaped examinations. Interruptions in data collection due to missed appointments was also not a problem.

Prior to the beginning of the data collection, the physical therapists were requested not to discuss any aspect of the study during its course. The physical therapists viewing the videotape under each knowledge condition viewed the tape together, each group in a separate room. All four groups viewed the videotapes simultaneously. Physical therapists were instructed to complete the assessment independently without discussing the infant or their scoring with the other participants. Seating of the therapists was arranged to prevent inadvertent viewing of other participants' ratings but allowed good visibility of the television monitor. Twenty four inch television monitors which allowed good visibility to all observers were used to display the videotape. Each group was monitored by an assistant to ensure that communication between the therapists did not occur during the viewing or scoring process.

A copy of the infant's medical history was provided to each therapist by an assistant prior to viewing the videotape. The assistant was not aware of the true or false nature of the history. The history was read to the physical therapists in each group by the assistant and the instructions to be followed during the data collection were reviewed (Appendix E). Each group of physical therapists viewed the videotaped examination once before scoring the Movement Assessment of Infants. The therapists were instructed to score all of the items included in the examination. The test items consistency, extensibility, and passivity in the muscle tone section of the examination were deleted from the examination. Scoring of these items after viewing the videotape would not be feasible since assessment of these items requires handling of the infant's limbs by the examiner. Item risk points were deleted from the rating form used by the physical therapists to avoid any influence that knowledge of the risk points might have on the therapists' scores. A time limit was not placed on the physical therapists for completion of the assessment after viewing the videotape.

A questionnaire was completed by each physical therapist following their scoring of the Movement Assessment of Infants examination (Appendix C). Questions regarding the physical therapists' opinion regarding the neuromotor prognosis of the infant, the need for further evaluation, and the need for physical therapy intervention were included.

Risk scores were calculated by the primary investigator, and the calculation was reviewed for accuracy by another individual.

C DATA ANALYSIS

1. Description of types of work experience of physical therapists participating in the investigation.

Means, standard deviation and ranges for the duration of total work experience, total pediatric experience and total experience with at-risk infants were calculated. The frequency of basis Neurodevelopmental Treatment training and Neurodevelopmental Baby Treatment training among the physical therapists was tallied as was training in the Movement Assessment of Infants and past experience with the examination.

2. Statistical analyses of equality of the experimental groups on the basis of type of experience following random assignment.

Following random assignment of the physical therapists to the four experimental groups one-way factorial analyses of variance for the factor experimental group were performed to determine whether there were significant differences between the groups on the basis of:

a clinical experience

b. pediatric experience

c. Experience with at-risk infants

Chi-square analyses was completed to examine differences between the groups on the basis of basic Neurodevelopmental Treatment

3. . Analysis of inter-rater reliability of risk scores during training in the use of the Movement Assessment of Infants Examination.

Ranges, percent agreement, means, standard deviations, standard error of the mean, and coefficients of variation (the ratio of the standard deviation to the mean) were calculated for section risk and total risk scores for three videotaped infant examinations.

4. Analyses of data derived from The Movement Assessment of Infants Examination risk scores.

The risk scores for the Movement Assessment of Infants are considered to be interval level data. Two-way factorial analyses of variance (Physical Therapists' Knowledge Of Prior Medical History; high-risk, low-risk) by (Actual Medical History; high-risk, low-risk) was performed to test the null and experimental hypotheses on the Movement Assessment of Infants risk scores. Alpha level of .05 was chosen to determine statistical significance. Statistical analyses was performed first on the total risk scores, then on risk scores for the four individual sections of the test; muscle tone, primitive reflexes, automatic reactions, and volitional movement.

5. Analyses of Responses to the Questionnaire.

Responses to the questionnaire to physical therapists were analyzed using Chi-Square analyses. Alpha level of .05 was chosen to determine statistical significance. Both the Chi-Square statistic and Chi-

Square statistic with continuity correction were calculated. Several statistical sources indicate that Yates correction or continuity correction should be used with Chi-square analysis in analyzing contingency tables when the minimum expected frequency is less than five in each cell since in these cases the Chi-Square calculation is biased in the direction of a type 1 error (Champion, 1981; Glantz, 1987; Pagano, 1986; Riegelman, 1981). However, It has been shown by Roscoe and Byars (1971) Conover (1974) and Camilli and Hopkins (1977) that it is justified to use Chi- Square with an average expected frequency as low as two. It was also found by Camilli and Hopkins (1977) that the Yates correction for continuity recommended for 2 x 2 tables is unnecessary and leads to the conservative values of alpha resulting from Chi-Square to be even more conservative. The contingency coefficient, a measure of association will be included in the summary of the statistical analysis. Cramer's V, a measure of association which can be calculated for contingency tables with more than 4 cells has been included for analysis to responses to question one. The phi coefficient has been included for 2 x 2 tables. The phi coefficient is a less conservative measure of association than the Contingency coefficient.

D DELIMITATIONS OF THE STUDY

This investigation examined the influence of knowledge of prior medical history on physical therapists' assessments of at-risk infants. The physical therapists who were involved in this investigation were those therapists who were practising in pediatrics in Edmonton and Calgary at the time of the investigation, had at least one year of experience and were willing to participate in the investigation. Therapists were not

randomly selected so could not be assumed to be representative of pediatric physical therapists practising in Edmonton and Calgary. One infant with an example of a high-risk medical history and one infant with an example of a low-risk medical history were assessment subjects. The Movement Assessment of Infants was the assessment tool used to assess the infants' neuromotor development. Approximately five hours of training in the use of this examination was provided to the therapists prior to data collection. The assessments of the infants were completed after viewing videotapes of infant examinations. The generalization of the results of the investigation to assessment situations where the physical therapist interacts with the infant directly is therefore not possible.

E LIMITATIONS OF THE STUDY

The reported reliability of the Movement Assessment of Infants risk scores is variable and has been reported as poor to excellent. Low levels of inter-rater reliability could be a factor in differences in the scoring of the infants which are not due to the influence of the independent variables.

The small sample size of pediatric physical therapists who were available as subjects may limit the power of the study particularly if the inter-rater reliability of the Movement Assessment of Infants risk scores is of low magnitude.

CHAPTER FOUR

RESULTS

A. SUMMARY OF CLINICAL EXPERIENCE OF PHYSICAL THERAPISTS.

The length of total clinical experience of the physical therapists ranged from 1 year to 25 years (mean 11.43, standard deviation 6.44). Total pediatric experience varied from .66 to 20.00 years (mean 7.46, standard deviation 4.91). Clinical experience with high-risk infants ranged from 0 to 5 years (mean .79, standard deviation 1.18). Twelve physical therapists (29%) had completed the basic eight week Pediatric Neurodevelopmental Treatment Course while one therapist had completed the Neurodevelopmental Baby Treatment course. One physical therapist had been trained in the use of the Movement Assessment of Infants while 5 had some previous experience with the examination.

Descriptive statistics for length of total clinical experience, total pediatric experience and experience with high risk infants are summarized in table 4.1.

TABLE 4.1

TYPE OF CLINICAL EXPERIENCE - PHYSICAL THERAPISTS

Type of Work Experience	Range	Mean	Standard Deviation
Total Work Experience	1-25 Years	11.43	6.44
Total Pediatric Experience	.66-20 Years	7.46	4.91
Total High-Risk Infant Experience	0-5 Years	.79	1.18

B. SUMMARY OF COMPARISONS OF PHYSICAL THERAPISTS' EXPERIENCE FOLLOWING RANDOM ASSIGNMENT TO EXPERIMENTAL GROUPS.

1. Results of one-way analysis of variance revealed no statistically significant difference between the groups on the basis of total years of clinical experience. Means and standard deviations for total years of clinical experience for the experimental groups are shown in table 4.2.

TABLE 4.2
MEANS AND STANDARD DEVIATIONS - TOTAL YEARS CLINICAL EXPERIENCE

EXPERIMENTAL GROUPS							
Group A		Group B		Group C		Group D	
Mean	S.D.	Mean	S. D.	Mean	S.D.	Mean	S.D.
11.15	8.41	12.35	6.95	11.25	5.96	11.00	5.05

Summary of the results of one-way analysis of variance between experimental groups for total years of clinical experience is shown in table 4.3.

TABLE 4.3
ANALYSIS OF VARIANCE - TOTAL YEARS CLINICAL EXPERIENCE

Source	D F.	Sum Squares	Mean Square	F-test
Between Groups	3	11.61	3.87	.087
Within Groups	37	1644.68	44.45	P=.9667
Total	40	1656.28		

2. Results of one-way analysis of variance showed no statistically significant difference between the groups on the basis of total years of pediatric experience. Means and standard deviations for total years of pediatric experience for the experimental groups are shown in table 4.4.

TABLE 4.4
MEANS AND STANDARD DEVIATIONS - TOTAL YEARS PEDIATRIC EXPERIENCE

Experimental groups							
Group A		Group B		Group C		Group D	
Mean	S.D.	Mean	S. D.	Mean	S.D.	Mean	S.D.
5.57	4.16	8.7O	5.03	8.90	5.78	6.73	4.50

Summary of results of one way analysis of variance for differences in total years of pediatric experience in the experimental groups is shown in table 4.5.

TABLE 4.5
ANALYSIS OF VARIANCE - TOTAL PEDIATRIC EXPERIENCE

Source	D F.	Sum Squares	Mean Square	F-test
Between Groups	3	77.89	25.96	1.08
Within Groups	37	886.31	23.95	P=.37
Total	40	964.20		

3. Results of one-way analysis of variance showed no statistically significant difference between the groups on the basis of total years of clinical experience working with at-risk infants. Means and standard

deviations for total years of clinical experience working with at-risk infants for the experimental groups are shown in table 4.6.

TABLE 4.6
MEANS AND STANDARD DEVIATIONS - TOTAL EXPERIENCE WITH AT-RISK INFANTS

Group A		Group B		Group C		Group D	
Mean	S.D.	Mean	S. D.	Mean	S.D.	Mean	S.D.
1.10	1.65	.92	1.25	.35	.67	.78	1.02

Summary of one-way analysis of variance for the difference between groups for total years of experience working with at-risk infants is shown in table 4.7.

TABLE 4.7
ANALYSIS OF VARIANCE - EXPERIENCE WITH AT-RISK INFANTS

Source	D F.	Sum Squares	Mean Square	F-test
Between Groups	3	3.05	1.02	.71
Within Groups	37	52.96	1.43	P=.55
Total	40	56.01		

4. Chi-square analysis revealed no significant differences between the experimental groups on the basis of basic training in Neurodevelopmental Treatment. Summary of observed frequencies and percentages of those trained and untrained in each group are is shown in table 4.8.

TABLE 4.8
OBSERVED FREQUENCIES AND PERCENTAGES - NEURODEVELOPMENTAL TREATMENT TRAINING IN EXPERIMENTAL GROUPS

	Group A	Group B	Group C	Group D
Yes	2 (20%)	2 (20%)	5 (50%)	3 (27.27%)
NO	8 (80%)	8 (80%)	5 (50%)	8 (72.73%)
Marginal Totals	10 100%	10 100%	10 100%	11 100%

Summary of Chi-square statistical analysis for differences in neurodevelopmental training in the experimental groups appears in table 4.9.

TABLE 4.9
SUMMARY OF CHI SQUARE ANALYSIS - NEURODEVELOPMENTAL TREATMENT TRAINING AND EXPERIMENTAL GROUP ASSIGNMENT

DF	3
Total Chi-Square	2.927 p=.403
Contingency Coefficient	.258

C. RESULTS OF INTER-RATER RELIABILITY TESTING OF MOVEMENT ASSESSMENT OF INFANTS RISK SCORES.

Results of testing for inter-rater reliability varied considerably. A complete summary of results of testing for inter-rater reliability during training in the use of The Movement Assessment of Infants appears in table 4.10 Percent agreement varied from 30.4% to 88% for section risk

scores and from 16% to 22.22% for total risk scores. The coefficients of variation varied form 14.5% to 148% for section risk scores and from 21.4% to 49.8% for total risk scores.

TABLE 4.10 RELIABILITY TESTING MOVEMENT ASSESSMENT OF INFANTS												
SUB-JECT	PERCENT AGREEMENT		MEAN		STANDARD DEVIATION		STANDARD ERROR		COEFFICIENT VARIATION		RANGE	
1	E	C	E	C	E	C	E	C	E	C	E	C
MT	52.2%	66.6%	3.522	3.944	.511	.998	.106	.235	14.5%	25.3%	3-4	1-6
PR	39.1%	33.3%	3.174	3.389	1.825	1.65	.381	.389	57.5%	48.7%	1-8	1-6
AR	39.0%	27.77%	3.00	4.50	.953	1.51	.199	.355	31.8%	33.4%	1-5	1-7
VM	30.4%	33.3%	4.609	5.833	1.852	2.093	.386	.493	40.2%	35.9%	1-8	2-10
TOTAL	17.4%	16.7%	17.667	14.304	4.116	3.066	.97	.639	23.3%	21.4%	8-20	10-26
2												
MT	34.8%		2.696		1.769		3.69		65.6%		0-5	
PR	47.8%		1.174		.887		.185		75.5%		0-3	
AR	34.8%	33.3%	2.652	2.444	1.335	1.723	.278	.406	50.3%	70.5%	1-5	0-6
VM	30.4%	44.4%	2.739	2.333	1.888	.907	.394	.214	68.9%	38.9%	0-7	1-4
TOTAL	17.4%		9.261		4.505		.939		48.6%		2-19	
3												
MT		88.9%		.222		.732		.173		329.4%		0-3
PR		50.0%		.722		.669		.158		92.6%		0-2
AR	65.2%	38.8%	.391	1.611	.583	.916	.122	.216	149.0%	56.9%	0-2	0-2
VM	43.5%	38.8%	1.13	2.00	.92	1.372	.192	.323	81.4%	68.6%	1-3	0-6
TOTAL		22.22%		4.222		2.102		.495		49.8%		1-9

Key to Table 4.10 on page 48

KEY TO TABLE 4.10

C = CALGARY
E = EDMONTON
CALGARY N =18
EDMONTON N =23
M.T. = MUSCLE TONE TOTAL RISK POINTS
P.R. = PRIMITIVE REFLEXES TOTAL RISK POINTS
A.R. = AUTOMATIC REACTIONS TOTAL RISK POINTS
V.M. = VOLITIONAL MOVEMENT TOTAL RISK POINTS
TOTAL = TOTAL RISK POINTS

D. RESULTS OF ANALYSIS OF VARIANCE - MOVEMENT ASSESSMENT OF INFANTS RISK SCORES.

The means and standard deviations for the total risk scores for each physical therapist knowledge condition are shown in table 4-11.

TABLE 4.11
MEANS AND STANDARD DEVIATIONS FOR TOTAL RISK SCORES

	PHYSICAL THERAPISTS' KNOWLEDGE		
ACTUAL MEDICAL HISTORY	KNOWLEDGE HIGH-RISK HISTORY	KNOWLEDGE LOW-RISK HISTORY	TOTALS
ACTUAL HIGH-RISK	M=17.30 S.D.=3.59	M=15.10 S.D.=4.65	16.20
ACTUAL LOW-RISK	M=10.70 S.D.=6.45	M= 6.00 S.D.=4.00	8.24
TOTALS	14.00	10.33	12.12

Results of two-way factorial analysis of variance revealed statistically significant effects of actual medical history and of physical therapists' knowledge of prior medical history on the Movement Assessment of Infants total risk scores. Interaction effects between these two variables were not statistically significant. Summary of the results of the statistical analysis is shown in table 4.12.

TABLE 4.12
ANALYSIS OF VARIANCE - TOTAL RISK SCORES

Source	DF	Sum of Squares	Mean Square	F-Test	P
Factor A	1	630.556	630.556	26.66	.0001
Factor B	1	121.793	121.793	5.15	.0292
AB	1	15.998	15.998	.676	.4162
Error	37	875.1	23.651		

Factor A = actual medical history
Factor B = physical therapists knowledge of prior medical history
DF =degrees of freedom

E. ANALYSIS OF VARIANCE FOR SECTION RISK TOTALS OF THE MOVEMENT ASSESSMENT OF INFANTS RISK

1. Muscle Tone Section Results of the analysis of variance indicated statistically significant effects of actual medical history and physical therapists' knowledge of medical history on the the muscle tone section risk score. Interaction effects between these two variables were not statistically significant. Means and standard deviations for section risk scores for each physical therapist knowledge condition is shown in table 4.13.

TABLE 4.13
MEANS AND STANDARD DEVIATIONS FOR SECTION
RISK TOTAL - MUSCLE TONE

	PHYSICAL THERAPISTS' KNOWLEDGE		
ACTUAL MEDICAL HISTORY	KNOWLEDGE HIGH-RISK HISTORY	KNOWLEDGE LOW-RISK HISTORY	TOTALS
ACTUAL HIGH RISK	M=4.80 S.D.=1.81	M=3.90 S.D.=2.13	4.35
ACTUAL LOW RISK	M=2.00 S.D.=1.33	M= .55 S.D.=1.04	1.24
TOTALS	3.40	2.14	2.76

Summary of analysis of variance for risk totals for the muscle tone section is shown in table 4.14.

TABLE 4.14
ANALYSIS OF VARIANCE - MUSCLE TONE SECTION RISK TOTAL

Source	DF	Sum of Squares	Mean Square	F-Test	P
Factor A	1	96.898	96.898	36.875	.0001
Factor B	1	14.182	14.182	5.397	.0258
AB	1	.787	.787	.299	.5876
Error	37	97.227	2.628		

Factor A = actual medical history
Factor B = physical therapists knowledge of prior medical history
DF=degrees of freedom

2. Primitive Reflex Section Results of the analysis of variance indicated statistically significant effects of actual medical history and physical therapists' knowledge of medical history on the primitive reflex section risk score. Interaction effects between these two variables were not statistically significant. Means and standard deviations for section risk scores for each physical therapist knowledge condition are shown in table 4.15.

TABLE 4.15
MEANS AND STANDARD DEVIATIONS
FOR
PRIMITIVE REFLEXES SECTION TOTALS

	PHYSICAL THERAPISTS' KNOWLEDGE		
ACTUAL MEDICAL HISTORY	KNOWLEDGE HIGH-RISK HISTORY	KNOWLEDGE LOW-RISK HISTORY	TOTALS
ACTUAL HIGH RISK	M = 5.70 S.D. = 1.34	M = 5.20 S.D.=1.32	5.45
ACTUAL LOW RISK	M = 4.90 S.D. = 2.47	M = 3.00 S.D.=1.84	3.91
TOTALS	5.30	4.05	4.66

Summary of analysis of variance for risk totals for the primitive reflex section is shown in table 4.16.

TABLE 4.16
ANALYSIS OF VARIANCE - PRIMITIVE REFLEX SECTION RISK TOTAL

Source	DF	Sum of Squares	Mean Square	F-Test	P
Factor A	1	23.023	23.023	7.064	.0115
Factor B	1	14.735	14.735	4.521	.0402
AB	1	5.014	5.014	1.538	.2227
Error	37	120.6	3.259		

Factor A = actual medical history

Factor B = physical therapists knowledge of prior medical history

DF =degrees of freedom

3. Automatic Reactions Section Results of the analysis of variance indicated a statistically significant effect of actual medical history but not of physical therapists' knowledge of prior medical history on the the automatic reaction section risk score. Interaction effects between these two variables were not statistically significant. Means and standard deviations for section risk scores for each physical therapist knowledge condition are shown in table 4.17.

TABLE 4.17
MEANS AND STANDARD DEVIATIONS-AUTOMATIC REACTION SECTION RISK TOTALS

	PHYSICAL THERAPISTS' KNOWLEDGE		
ACTUAL MEDICAL HISTORY	KNOWLEDGE HIGH-RISK HISTORY	KNOWLEDGE LOW-RISK HISTORY	TOTALS
ACTUAL HIGH RISK	M = 3.20 S.D. =1.48	M = 2.80 S.D.=1.03	3.00
ACTUAL LOW RISK	M = .60 S.D.= 1.27	M = .18 S.D.= .60	.38
TOTALS	1.90	1.43	1.66

Summary of analysis of variance for section risk totals for the automatic reaction section is shown in table 4.18.

TABLE 4.18
ANALYSIS OF VARIANCE - AUTOMATIC REACTION SECTION RISK TOTAL

Source	DF	Sum of Squares	Mean Square	F-Test	P
Factor A	1	69.657	69.657	54.562	.0001
Factor B	1	1.712	1.712	1.341	.2542
AB	1	.001	.001	.001	.9796
Error	37	47.236	1.277		

Factor A = actual medical history

Factor B = physical therapists knowledge of prior medical history

DF = degrees of freedom

4. Volitional Movement Section Results of the analysis of variance did not indicate a statistically significant effect of actual medical history or physical therapists' knowledge of medical history on the the volitional movement section risk score. Interaction effects between these two variables were not statistically significant. Means and standard deviations for section risk scores for each physical therapist knowledge condition are shown in table 4.19.

TABLE 4.19
MEANS AND STANDARD DEVIATIONS - VOLITIONAL MOVEMENT SECTION RISK TOTALS

	PHYSICAL THERAPISTS' KNOWLEDGE		
ACTUAL MEDICAL HISTORY	KNOWLEDGE HIGH-RISK HISTORY	KNOWLEDGE LOW-RISK HISTORY	TOTALS
ACTUAL HIGH RISK	M = 3.60 S.D.= .70	M = 3.20 S.D.= 1.81	3.40
ACTUAL LOW RISK	M = 3.20 S.D. = 1.99	M = 2.27 S.D. = 1.90	2.71
TOTALS	3.40	2.71	3.05

Summary of analysis of variance for section risk totals for the volitional movement section is shown in table 4.20.

TABLE 4.20

ANALYSIS OF VARIANCE - VOLITIONAL MOVEMENT SECTION RISK TOTAL

Source	DF	Sum of Squares	Mean Square	F-Test	P
Factor A	1	4.507	4.507	1.576	.2172
Factor B	1	4.507	4.507	1.576	.2172
AB	1	.711	.711	.249	.6209
Error	37	105.782	2.859		

Factor A = actual medical history

Factor B = physical therapists knowledge of prior medical history

DF = degrees of freedom

C RESULT OF STATISTICAL ANALYSIS : RESPONSES TO THE QUESTIONNAIRE TO PHYSICAL THERAPISTS

Question One

How do you rate this child's overall neuromotor developmental status?

( ) normal

( ) suspicious

( ) abnormal

Infant With An Actual Low-Risk History

Chi-Square analysis of responses of physical therapists regarding neuromotor status in relation to knowledge conditions of a high-risk medical history or of a low-risk medical history indicated a statistically significant difference in the physical therapists' general impression of this infant's neuromotor status. The observed frequencies, expected frequencies and a summary of the statistical analysis are shown in tables

TABLE 4.21
OBSERVED FREQUENCIES
INFANT WITH ACTUAL LOW-RISK MEDICAL HISTORY
QUESTION ONE

	High-Risk History		Low-Risk History	
normal	1	10%	8	72.73%
abnormal	1	10%	1	9.09%
suspicious	8	80%	2	18.18%
Marginal Totals	10	100%	11	100%

TABLE 4.22
EXPECTED FREQUENCIES
INFANT WITH ACTUAL LOW-RISK MEDICAL HISTORY
QUESTION ONE

	High-Risk History		Low-Risk History	
normal	4.29	42.9%	4.71	42.82%
abnormal	.95	9.5%	1.05	9.55%
suspicious	4.76	47.6%	5.24	47.63%
Marginal Totals	10	100%	11	100%

TABLE 4.23
SUMMARY OF STATISTICAL ANALYSIS
INFANT WITH ACTUAL LOW RISK MEDICAL HISTORY
QUESTION ONE

DF	2	
Total Chi-Square	9.017	p=.011
Contingency Coefficient	.548	
Cramer's V	.655	

Infant With Actual High-Risk History.

Chi-Square analysis of responses of physical therapists regarding neuromotor status in relation to knowledge conditions of a high-risk medical history or of a low-risk medical history did not reveal a statistically significant difference in the physical therapists' general impression of this infant's neuromotor status. The observed frequencies, expected frequencies and a summary of the statistical analysis are

TABLE 4.24

OBSERVED FREQUENCIES

INFANT WITH ACTUAL HIGH-RISK MEDICAL HISTORY

QUESTION ONE

	High-Risk History		Low-Risk History	
normal	0	0%	1	10%
abnormal	3	30%	1	10%
suspicious	7	70%	8	80%
Marginal Totals	10	100%	10	100%

TABLE 4.25

EXPECTED FREQUENCIES

INFANT WITH ACTUAL HIGH-RISK MEDICAL HISTORY

QUESTION ONE

	High-Risk History		Low-Risk History	
normal	.5	5%	.5	5%
abnormal	2	20%	2	20%
suspicious	7.5	75%	7.5	75%
Marginal Totals	10	10%	10	100%

TABLE 4.26

SUMMARY OF STATISTICAL ANALYSIS

INFANT WITH ACTUAL HIGH-RISK MEDICAL HISTORY

QUESTION ONE

DF	2	
Total Chi-Square	2.067	p=.3558
Contingency Coefficient	.306	
Cramer's V	.321	

Question Two

Do you feel it is warranted to review this child's status at a further date?

( ) yes

( ) no

Infant With An Actual Low-risk Medical History

Chi-Square analysis of responses of physical therapists with conditions of a high-risk history and a low-risk history revealed a statistically significant difference in the physical therapists' recommendations for future review of this infant's status. The observed frequencies, expected frequencies and a summary of the statistical analysis are shown in tables 4.27 - 4.29.

TABLE 4.27
OBSERVED FREQUENCIES
INFANT WITH ACTUAL LOW-RISK MEDICAL HISTORY
QUESTION TWO

	High-Risk History		Low-Risk History	
yes	9	90%	4	36.36%
no	1	10%	7	63.64%
Marginal Totals	10	100%	11	100%

TABLE 4.28
EXPECTED FREQUENCIES
INFANT WITH ACTUAL LOW-RISK MEDICAL HISTORY
QUESTION TWO

	High-Risk History		Low-Risk History	
yes	6.19	61.9%	6.81	61.91%
no	3.81	38.1%	4.19	38.09%
Marginal Totals	10	100%	11	100%

TABLE 4.29
SUMMARY OF STATISTICAL ANALYSIS
INFANT WITH ACTUAL LOW-RISK MEDICAL HISTORY
QUESTION TWO

DF 1	
Total Chi-Square	6.39 p=.0115
Chi-square With Continuity Correction	4.318 p=.0377
Contingency Coefficient	.483
Phi	.552

Infant with Actual High-Risk Medical History.

All Physical therapists under both knowledge conditions felt that it was warranted to review this infant with the actual high-risk medical history at a further date.

Question Three

Do you feel that this child requires intervention by a physical therapist at this time?

( ) Yes

( ) No

Infant With An Actual Low-Risk Medical History

Chi-Square analysis of responses of physical therapists with conditions of a high-risk history and a low-risk history revealed a statistically significant difference in the physical therapists' recommendations for intervention with this infant. The observed frequencies, expected frequencies and a summary of the statistical analysis are shown in tables 4.30 - 4.32.

TABLE 4.30
OBSERVED FREQUENCIES
INFANT WITH ACTUAL LOW-RISK MEDICAL HISTORY
QUESTION THREE

	High-Risk History		Low-Risk History	
yes	3	30%	0	0%
no	7	70%	11	100%
Marginal Totals	10	100%	11	100%

TABLE 4.31
EXPECTED FREQUENCIES
INFANT WITH ACTUAL LOW-RISK MEDICAL HISTORY
QUESTION THREE

	High-Risk History		Low-Risk History	
yes	1.43	14.3%	1.57	14.27%
no	8.57	85.7%	9.43	85.73%
Marginal Totals	10	100%	11	100%

TABLE 4.32
SUMMARY OF STATISTICAL ANALYSIS
INFANT WITH ACTUAL LOW-RISK MEDICAL HISTORY
QUESTION THREE

DF 1		
Total Chi-Square	3.85	p=.0497
Chi-square With Continuity Correction	1.79	p=.181
Contingency Coefficient	.394	
Phi	.428	

Infant With An Actual High-Risk Medical History.

Chi-Square analysis of responses of physical therapists with conditions of a high-risk history and a low-risk history was not statistically significant for differences in the physical therapists'

recommendations for intervention. The observed frequencies, expected frequencies and a summary of the statistical analysis are shown in table 4.33 and 4.35.

TABLE 4.33
OBSERVED FREQUENCIES
INFANT WITH ACTUAL HIGH-RISK HISTORY
QUESTION THREE

	High-Risk History		Low-Risk History	
yes	9	90%	5	50%
no	1	10%	5	50%
Marginal Totals	10	100%	10	100%

TABLE 4.34
EXPECTED FREQUENCIES
INFANT WITH ACTUAL HIGH-RISK MEDICAL HISTORY
QUESTION THREE

	High-Risk History		Low-Risk History	
yes	7	70%	7	70%
no	3	30%	3	30%
Marginal Totals	10	100%	10	100%

TABLE 4.35
SUMMARY OF STATISTICAL ANALYSIS
INFANT WITH ACTUAL HIGH-RISK MEDICAL HISTORY
QUESTION THREE

DF 1	
Total Chi-Square	3.81 p=.051
Chi-square With Continuity Correction	2.143 p=.1432
Contingency Coefficient	.4
Phi	.436

Chi-square analyses were also completed on the responses to each question using the following combinations of actual medical history and physical therapists' knowledge of medical history.

1. High- risk medical history with physical therapists' knowledge of high-risk history and low-risk medical history with physical therapists' knowledge of low-risk medical history.

2. High-risk medical history with physical therapists' knowledge of low-risk medical history and low-risk medical history with physical therapists' knowledge of high- risk medical history.

Question One

There was a statistically significant difference in the physical therapists' impression of neuromotor status between conditions where the infant with an actual high-risk history was assessed with knowledge of a high-risk history and an infant with an actual low-risk history was assessed with knowledge of a low- risk history. Observed frequencies, expected frequencies and statistical analysis for responses to question one in relation to combinations of actual high- risk medical history with physical therapists' knowledge of high-risk history and actual low -risk medical history with physical therapists' knowledge of low-risk medical history are shown in tables 4.36 - 4.38.

TABLE 4.36
OBSERVED FREQUENCIES
QUESTION ONE

	AHRMH / KHRMH		ALRMH / KLRMH	
normal	0	0%	8	72.73%
abnormal	3	30%	1	18.18%
suspicious	7	70%	2	9.09%
Marginal Totals	10	100%	11	100%

AHRMH = Actual High-Risk Medical History
KHRMH = Knowledge High-Risk Medical History
ALRMH = Actual Low-Risk Medical History
KLRMH = Knowledge Low-Risk Medical History

TABLE 4.37
EXPECTED FREQUENCIES
QUESTION ONE

	AHRMH / KHRMH		ALRMH / KLRMH	
normal	3.81	38.1%	4.19	38.09%
abnormal	1.9	19%	2.1	19.09%
suspicious	4.29	42.9%	4.71	42.82%
Marginal Totals	10	100%	11	100%

AHRMH = Actual High-Risk Medical History
KHRMH = Knowledge High-Risk Medical History
ALRMH = Actual Low-Risk Medical History
KLRMH = Knowledge Low-Risk Medical History

TABLE 4.38
SUMMARY OF STATISTICAL ANALYSIS
QUESTION ONE

DF	2	
Total Chi-Square	11.757	p=.0028
Contingency Coefficient	.599	
Cramer's V	.748	

There was not a statistically significant difference in the physical therapists' impression of neuromotor status between conditions where the infant with an actual high-risk history was assessed with knowledge of a low-risk history and an infant with an actual low-risk history was assessed with knowledge of a high-risk history. Observed frequencies, expected frequencies and statistical analysis for responses to question one in relation to combinations of actual high- risk medical history with physical therapists' knowledge of low-risk medical history and actual low - risk medical history with physical therapists' knowledge of high-risk medical history are shown in tables 4.39 - 4.41.

TABLE 4.39
OBSERVED FREQUENCIES
QUESTION ONE

	AHRMH / KLRMH		ALRMH / KHRMH	
normal	1	10%	1	10%
abnormal	1	10%	1	10%
suspicious	8	80%	8	80%
Marginal Totals	10	100%	10	100%

AHRMH = Actual High-Risk Medical History
KHRMH = Knowledge High - Risk Medical History
ALRMH = Actual Low - Risk Medical History
KLRMH = Knowledge Low -Risk Medical History

TABLE 4.40
EXPECTED FREQUENCIES
QUESTION ONE

	AHRMH / KLRMH		ALRMH / KHRMH	
normal	1	10%	1	10%
abnormal	1	10%	1	10%
suspicious	8	80%	8	80%
Marginal Totals	10	100%	10	100%

AHRMH = Actual High-Risk Medical History
KHRMH = Knowledge High - Risk Medical History
ALRMH = Actual Low - Risk Medical History
KLRMH = Knowledge Low -Risk Medical History

TABLE 4.41
SUMMARY OF STATISTICAL ANALYSIS
QUESTION ONE

DF	2	
Total Chi-Square	0	p=1
Contingency Coefficient	0	
Cramer's V	0	

There was a statistically significant difference in the physical therapists' opinions regarding the necessity for future review of the infant's neuromotor status between conditions where the infant with an actual high-risk history was assessed with knowledge of a high-risk history and an infant with an actual low- risk history was assessed with knowledge of a low-risk history. Observed frequencies, expected frequencies and statistical analysis for responses to question two in relation to combinations of high-risk medical history with physical therapists' knowledge of high-risk medical history and low-risk medical

history with physical therapists' knowledge of low-risk medical history are shown in tables 4.42 - 4.44.

TABLE 4.42
OBSERVED FREQUENCIES
QUESTION TWO

	AHRMH / KHRMH		ALRMH / KLRMH	
yes	10	100%	4	36.36%
no	0	0%	7	63.64%
Marginal Totals	10	100%	11	100%

AHRMH = Actual High-Risk Medical History
KHRMH = Knowledge High - Risk Medical History
ALRMH = Actual Low - Risk Medical History
KLRMH = Knowledge Low -Risk Medical History

TABLE 4.43
EXPECTED FREQUENCIES
QUESTION TWO

	AHRMH / KHRMH		ALRMH / KLRMH	
yes	6.67	66.7%	7.33	66.6%
no	3.33	33.3%	3.67	33.3%
Marginal Totals	10	100%	11	100%

AHRMH = Actual High-Risk Medical History
KHRMH = Knowledge High - Risk Medical History
ALRMH = Actual Low - Risk Medical History
KLRMH = Knowledge Low -Risk Medical History

TABLE 4.44
SUMMARY OF STATISTICAL ANALYSIS

QUESTION TWO

DF 1		
Total Chi-Square	9.545	p=.002
Chi-square With Continuity Correction	6.897	p=.0086
Contingency Coefficient	.559	
Phi	.674	

There was not a statistically significant difference in the physical therapists' opinions regarding the necessity for future review of the infant's neuromotor status between conditions where the infant with an actual high-risk history was assessed with knowledge of a low-risk history and an infant with an actual low-risk history was assessed with knowledge of a high-risk history.

Observed frequencies, expected frequencies and statistical analysis for responses to question two in relation to combinations of actual high-risk medical history with physical therapists' knowledge of low-risk medical history and actual low -risk medical history with physical therapists' knowledge of high-risk medical history are shown in tables 4.45 - 4.47.

TABLE 4.45
OBSERVED FREQUENCIES
QUESTION TWO

	AHRMH / KLRMH		ALRMH / KHRMH	
yes	10	100%	9	90%
no	0	0%	1	10%
Marginal Totals	10	100%	10	100%

AHRMH = Actual High-Risk Medical History
KHRMH = Knowledge High - Risk Medical History
ALRMH = Actual Low - Risk Medical History
KLRMH = Knowledge Low -Risk Medical History

TABLE 4.46
EXPECTED FREQUENCIES
QUESTION TWO

	AHRMH / KLRMH		ALRMH / KHRMH	
yes	9.5	95%	9.5	95%
no	.5	5%	.5	5%
Marginal Totals	10	100%	10	100%

AHRMH = Actual High-Risk Medical History
KHRMH = Knowledge High - Risk Medical History
ALRMH = Actual Low - Risk Medical History
KLRMH = Knowledge Low -Risk Medical History

TABLE 4.47
SUMMARY OF STATISTICAL ANALYSIS
QUESTION TWO

	DF 1	
Total Chi-Square	1.053	p=.3049
Chi-square With Continuity Correction	0	p=1
Contingency Coefficient	.224	
Phi	.229	

There was a statistically significant difference in the physical therapists' opinions regarding the necessity for intervention by a physical therapist between conditions where the infant with an actual high-risk history was assessed with knowledge of a high-risk history and an infant with an actual low-risk history was assessed with knowledge of a low-risk history. Observed frequencies, expected frequencies and statistical analysis for responses to question three in relation to combinations of high- risk medical history with physical therapists' knowledge of high-risk history and low-risk medical history with physical therapists' knowledge of low-risk medical history are shown in table 4.48 - 4.50.

TABLE 4.48
OBSERVED FREQUENCIES
QUESTION THREE

	AHRMH / KHRMH		ALRMH / KLRMH	
yes	9	90%	0	0%
no	1	10%	11	100%
Marginal Totals	10	100%	11	100%

AHRMH = Actual High-Risk Medical History
KHRMH = Knowledge High - Risk Medical History
ALRMH = Actual Low - Risk Medical History
KLRMH = Knowledge Low -Risk Medical History

TABLE 4.49
EXPECTED FREQUENCIES
QUESTION THREE

	AHRMH / KHRMH		ALRMH / KLRMH	
yes	4.29	42.9%	4.71	42.82%
no	5.71	57.1%	6.29	57.18%
Marginal Totals	10	100%	11	100%

AHRMH = Actual High-Risk Medical History
KHRMH = Knowledge High - Risk Medical History
ALRMH = Actual Low - Risk Medical History
KLRMH = Knowledge Low -Risk Medical History

TABLE 4.50
SUMMARY OF STATISTICAL ANALYSIS
QUESTION THREE

	DF 1	
Total Chi-Square	17.325	p=.0001
Chi-Square With Continuity Correction	13.845	p=.0002
Contingency Coefficient	.672	
Phi	.908	

There was not a statistically significant difference in the physical therapists' opinions regarding the necessity for intervention by a physical therapist between conditions where the infant with an actual high-risk history was assessed with knowledge of a low-risk history and an infant with an actual low-risk history was assessed with knowledge of a high-risk history.

Observed frequencies, expected frequencies and statistical analysis for responses to question three in relation to combinations of actual high-risk medical history with physical therapists' knowledge of low-risk medical history and actual low-risk medical history with physical therapists' knowledge of high-risk medical history are shown in table 4.51

TABLE 4.51
OBSERVED FREQUENCIES
QUESTION THREE

	AHRMH / KLRMH		ALRMH / KHRMH	
yes	5	50%	3	30%
no	5	50%	7	70%
Marginal Totals	10	100%	10	100%

AHRMH = Actual High-Risk Medical History
KHRMH = Knowledge High - Risk Medical History
ALRMH = Actual Low - Risk Medical History
KLRMH = Knowledge Low -Risk Medical History

TABLE 4.52
EXPECTED FREQUENCIES
QUESTION THREE

	AHRMH / KLRMH		ALRMH / KHRMH	
yes	4	40%	4	40%
no	6	60%	6	60%
Marginal Totals	10	100%	10	100%

AHRMH = Actual High-Risk Medical History
KHRMH = Knowledge High - Risk Medical History
ALRMH = Actual Low - Risk Medical History
KLRMH = Knowledge Low -Risk Medical History

TABLE 4..53
SUMMARY OF STATISTICAL ANALYSIS
QUESTION THREE

	DF 1
Total Chi-Square	.833 p=.3613
Chi-Square With Continuity Correction	.208 p=.6481
Contingency Coefficient	.2
Phi	.204

CHAPTER FIVE

DISCUSSION AND CONCLUSIONS

The results of this investigation suggest that expectancies related to physical therapists' knowledge of past medical history influence physical therapists' scoring of infant neuromotor examinations. Mean total risk scores and section risk scores for muscle tone and primitive reflexes were lower for the high-risk infant with a low-risk medical history than for the same infant with a high-risk medical history. Similarly mean total risk and section risk scores for the muscle tone and primitive reflexes sections were higher for the low-risk infant with a high-risk medical history than for the same infant with an actual low-risk medical history. This pattern of scoring is consistent with the expectancies which logically could be related to the magnitude of high and low-risk factors in the actual and fabricated infant medical histories used in this investigation. A history containing information with obvious high-risk factors should logically induce expectancies of possible neuromotor abnormalities or motor delays. These expectancies could result in the observation and interpretation of the infant's behavior and the subsequent rating of test items in a manner that would result in a relatively high number of risk points. Conversely a medical history containing few high-risk factors should induce expectancies of normal neuromotor status which should be reflected in observation and interpretation of the infant's behavior and subsequent scoring of the examination in a manner which would result

A statistically significant main effect of physical therapist knowledge of past medical history was not present for the automatic reactions and volitional movement sections of the examination. Although these differences for these sections did not reach the level of statistical

significance necessary to reject the null hypothesis, the direction of the difference in mean section risk totals also exhibited the same pattern as that shown by the muscle tone and primitive reflexes section in relation to the physical therapists' medical history knowledge conditions. In the case of the automatic reactions section the risk scores showed a high variation in relation to the mean under both knowledge conditions for the low-risk infant which may have obscured the main effect of physical therapists' history knowledge. In the case of the volitional movement section there was little difference in the mean risk scores for the high and low-risk infant for any of the knowledge conditions. Since different sections of this examination measure different aspects of neuromotor behavior it is possible that knowledge of history may bias the perceptions of the therapists more during observation of some aspects of motor behavior than others. Physical therapists may associate status of muscle tone and primitive reflexes with relatively normal or abnormal neuromotor status more than they do the status of automatic reactions and volitional movement. They may, therefore, be more attentive to the items that measure muscle tone and primitive reflexes and associate the infant's status with the medical history. The presence of brain dysfunction in both children and adults has been traditionally associated with abnormalities of muscle tone and primitive reflexes. The assessment of primitive reflexes and muscle tone has been heavily emphasized in the literature related to assessment of both pediatric and adult neurological patients (Bobath 1970; 1971; 1985; Brunnstrom, 1970; Fiorentino, 1963).

The infant with an actual high-risk medical history obtained higher total risk scores and section risk scores for muscle tone, primitive reflexes, and automatic reactions than the infant with the actual low-risk

medical history. That is to say, the degree of risk actually present was reflected in the scoring of the Movement Assessment of Infants. This pattern in scoring suggests that the Movement Assessment of Infants discriminates infants with an actual low-risk medical status from infants with an actual high-risk medical status.

The factor of actual medical history did not have a statistically significant influence on the scores of the volitional movement section. The pattern of direction in mean differences which would be expected in relation to influence of actual medical history was however also observed in the volitional movement section. Possibly the risk profile associated with the volitional movement section is not highly discriminating in the distinction of the volitional movement of high from that of low-risk infants at four months of age. The items included in the volitional movement section and the scoring of the items may be only sensitive enough to detect major deviations from normal movement.

While the interaction effects between knowledge of medical history and actual risk status were not statistically significant, the clinical significance of the findings varied according to the risk status of the infants. When interpreting the results of this examination, total risk scores ≥ 7 are commonly used to distinguish infants who are considered to be at high-risk from those who are at low-risk for developmental problems (Chandler et al. , 1980). In the case of the high--risk infant with a high-risk medical history the mean total risk points were 17.3 compared to a total of 15.1 for the same infant with a low-risk medical history. Both of these total risk scores indicate a very high-risk status for this infant in relation to usual classification criteria. Though the mean total risk points were lower in relation to the physical therapist knowledge condition of a

low-risk history, the difference in this mean score and that obtained under the condition of physical therapist knowledge of a high-risk history would be unlikely to have a differential effect on the physical therapists' recommendations to review or to intervene following assessment.

In the case of the low-risk infant with low-risk medical history, the mean total-risk points were 6.0 compared to a total of 10.7 for the same infant with a high-risk medical history. These two risk point totals would in all likelihood be interpreted quite differently clinically. The higher total score of 10.7 would indicate that this infant is at risk for developmental problems, while the lower value of 6.0 would be less likely to elicit concern on the part of the assessing physical therapist. The differences in risk totals for this low-risk infant could lead to different recommendations on the part of the physical therapist in relation to the necessity to review or to treat this infant. With the knowledge condition of a high-risk medical history, 80% of the physical therapists assigned this infant total risk points greater than 7 while under the knowledge condition of a low-risk medical history 36.4% assigned the infant risk

The physical therapists' responses to the questionnaire generally corresponded to responses which would be expected relative to the total risk scores which were observed on the Movement Assessment of Infants for different physical therapist knowledge conditions. The statistically significant difference between physical therapists' knowledge of past medical history and their impression of neuromotor status in the case of the low-risk infant suggests that expectancies related to knowledge of past medical history influenced the physical therapists' perceptions of this infant's motor and neurological status. Under the knowledge condition of a high-risk medical history, 80% of the physical therapists rated the low-

risk infant's neuromotor status as suspicious and 10% rated the child as normal while under the knowledge condition of a low-risk medical history 72.73% of the physical therapists rated the same infant as normal and 18.18% as suspicious. This response pattern supports the MAI mean total risk scores. The majority of therapists who had knowledge of a high-risk medical history in relation to this low-risk infant rated the infant as suspicious in terms of neuromotor status. The mean total risk score of 10.7 for this infant as scored by this group of therapists also indicated a concern for neuromotor status. Conversely the majority of therapists who had knowledge of a low-risk history rated this low-risk infant as normal which would logically follow from the lower mean MAI total risk score of 6.0.

In the case of the high-risk infant there was no statistically significant difference between medical history knowledge and impression of neuromotor status. With a low risk medical history, 80% of the physical therapists rated this high-risk infant as suspicious, 10% considered the child to be normal and 10% considered the child to be abnormal. With a high risk medical history, 70% of the physical therapists considered this high-risk infant to be suspicious, none of the physical therapists considered the child to be normal while 30% considered the infant to be abnormal. Thus the responses of the majority of physical therapists under both knowledge conditions indicated concern regarding this infant's neuromotor status. The pattern of responses is consistent with the mean MAI total risk scores which reflected a very high-risk

The statistically significant difference between different knowledge of medical history and opinion regarding the need for future review in the case of the low-risk infant suggests that physical therapist

expectancies related to knowledge of past medical history influenced the judgement of physical therapists regarding the need for future review of this infant's neuromotor status. With a high-risk medical history, 90% of the physical therapists responded in the affirmative in response to the question of the need for future review. With a low-risk medical history only 36.36% felt that future review was necessary. This pattern of responses is logically related to responses to the previous question in the case of this low-risk infant. The majority of the physical therapists under the knowledge condition of a high-risk medical history rated this low-risk infant's neuromotor status as suspicious while the majority rated the same infant's neuromotor status as normal under the knowledge condition of a low-risk medical history. A suspicious rating would logically lead to a recommendation for a future review of neuromotor status while a normal rating would lead to a recommendation of no necessity for a future review. The differing responses in relation to the two knowledge conditions is also consistent with the total MAI risk scores.

In the case of the high-risk infant with an actual high-risk medical history all physical therapists under both medical history knowledge conditions recommended future review of the infant. These responses are also consistent with the responses in relation to the physical therapists' opinion regarding the infant's neuromotor status. The majority of physical therapists under both knowledge conditions rated this child as suspicious or abnormal which would indicate a need for a further assessment. The responses are also consistent with the mean total MAI risk scores in relation to the two physical therapist knowledge conditions for this infant.

The statistically significant difference between the physical therapists' knowledge condition and their opinion regarding the need for

intervention by a physical therapist in the case of the low-risk infant suggests again that expectancies related to the knowledge of past medical history influenced the therapists' opinions regarding the need for intervention. None of the physical therapists believed that the low-risk infant with the low-risk history required intervention by a physical therapist while 30% believed that the same infant with a high-risk medical history required intervention.

The difference between physical therapists' knowledge of past medical history and the physical therapists' opinion regarding the necessity for physical therapy intervention was not statistically significant ($p=.051$). In the case of the high-risk infant 90% of the physical therapists under the knowledge condition of a high-risk history would recommend review while 50% would recommend treatment under the knowledge condition of a low-risk history.

The less defined differences in the physical therapists' responses regarding the necessity for treatment in comparison to their responses regarding the necessity for review of the infant's status may be partially explained by the pattern of responses regarding the infant's neuromotor status. A greater proportion of the therapists rated both infants with a high risk history more negatively in terms of the infant's neuromotor status. However, few physical therapists labeled the infants with high-risk medical histories as abnormal. A rating of suspicious was quite common under the high-risk knowledge condition. The impression of a suspicious neuromotor status would more likely lead to a recommendation for future review of neuromotor status than for intervention by a physical therapist.

When there was a congruency between actual neuromotor status and the risk factors in medical history, the physical therapists responded

to questions in relation to impressions of neuromotor status, the necessity for review, and intervention in very different patterns for each infant. When there was incongruency between actual neuromotor status and risk factors in the medical history, the physical therapists responded to these questions in a relatively similar manner for each infant. It is apparent in comparing the response patterns between conditions of congruency and incongruency that the changes in response pattern occur mainly in relation to the infant with actual low-risk neuromotor status. When this low-risk infant was assessed with a medical history containing high-risk factors, the therapists responded to the questions in a manner very similar to the response pattern of the therapists assessing the infant with actual high-risk neuromotor status under both history knowledge conditions. The physical therapists appeared to interpret this low-risk infant's neuromotor behavior more in terms of the high-risk medical history than the movement responses exhibited by the infant.

The scoring of the MAI by the physical therapists prior to completing the questionnaire may have influenced their responses to the questionnaire. Although the physical therapists were not aware of the risk points which were associated with each test item, their awareness of their general rating of the items may have affected their questionnaire responses. The rating of the MAI thus could also create expectancies.

The apparent influence of knowledge of past medical history on the evaluations by physical therapists of at-risk infants in this investigation supports the view that physical therapists have stereotyped views that a strong association exists between prior medical history and the developmental outcome of at-risk infants. These views appear to be present in spite of evidence that they are largely unsubstantiated. The

influence of prior knowledge of medical history on the assessments of at-risk infants by physical therapists in this investigation suggests an illusory correlation between prior medical history and developmental outcome in the minds of the physical therapists. Perhaps some basis for such mistaken views of the strength of the relationship between past medical history and developmental outcome may be related to the limited contact many physical therapists may have with infants who have a high-risk medical history and a normal developmental outcome. Conversely, they may have more contact with children who are developmentally disabled and have a high-risk history. The particular professional role of the physical therapist may limit contact with the broad range of developmental outcome in at-risk infants. Many physical therapists involved in this investigation may have been educated to believe that perinatal events have an exaggerated importance in predicting later developmental problems.

The most important implications of this investigation are related to the assessment of the infant with the actual low-risk neuromotor status. When assessed with a high-risk medical history this infant was rated in a range that would indicate concern; and the questionnaire responses indicated that a high proportion of physical therapists would perceive this infant's neuromotor status as suspicious and would recommend review. The MAI risk scores and questionnaire responses were dramatically different than those obtained when this child was assessed with a low-risk medical history. This result would imply special concern for the validity of the assessments of infants who exhibit neuromotor behavior which is within normal limits but have a high-risk medical history of which the examiner is aware. The very different results of physical

therapists' assessments with differing medical history knowledge in the case of this infant raise the concern of a false positive assessment result in the case of the high-risk history. If such an assessment result containing a negative impression of the child's developmental status is communicated to parents, unnecessary parental worry and concern may result. As is evident from the literature, parents of at-risk infants are especially vulnerable as the result of an at-risk birth. Because of an at-risk birth they may well have some concern regarding their child's development which might be compounded by negative assessment information communicated by a professional. It is also evident from past research that parents are very sensitive to assessment information communicated by professionals regarding their children. Past investigations have also indicated that false positive assessment results may be of significant consequence in terms of their impact on parents' perceptions and interactions with their child. Maladaptive child development may be a result. False positive assessment results in relation to assessment of at-risk infants could also result in costly unnecessary reassessment.

Since the assessments in this investigation were completed after viewing videotapes of infant motor activities, caution must be exercised in generalizing the results to typical assessment situations where the physical therapist interacts directly with the infant. Future investigation of expectancy effects in such assessment circumstances are warranted. Direct interaction between the physical therapist and the child raises the possibility of self-confirming behavior on the part of the infant in response to the physical therapists' interaction in response to

The effect of expectancies on physical therapists of two specific examples of past medical history were examined in this investigation. The high-risk medical history contained a substantial number of high-risk factors and the low-risk medical history was distinctively low-risk. High and low-risk histories containing different combinations and degrees of risk factors could well enduce different expectancies. Particular risk factors or their absence may be perceived by physical therapists as having greater importance in prognosis than other risk factors.

The amount of pediatric experience and experience assessing at-risk infants varied widely among the physical therapists involved in this investigation. It is not known whether physical therapists who have extensive experience with at-risk infants would be influenced differently by expectancies related to prior medical history.

The levels of inter-rater reliability of the section and total risk scores obtained during the training session were less than ideal which would add to the error variance in the scores. The effect of increasing error variance would be a reduction in the likelihood of obtaining significant group differences. Thus, when significant differences are found they likely represent quite robust effects.

The group environment in which the physical therapists assessed the videotaped infants may have influenced the physical therapists to be especially vigilant in searching for abnormalities even though the therapists were not permitted to communicate in relation to the assessment. Therapists may have viewed the lack of detection of an abnormal sign as a reflection of their professional competence especially if it was detected by their colleagues. However, such an effect, if present, would seem likely to affect all of the groups equally.

The possibility that expectancies related to knowledge of past medical history may influence other professionals who are commonly involved in the assessment of at-risk infants merits future investigation. That such expectancies would influence only physical therapists would

The results of the data analysis support a decision to reject the null hypothesis that prior knowledge of medical history does not influence physical therapists' assessments of at-risk infants. The alternate hypothesis that knowledge of a high-risk history will influence physical therapists to evaluate a low-risk infant less favorably was accepted. The alternate hypothesis that prior knowledge of a low-risk medical history will influence physical therapists to evaluate a high-risk infant more favorably was also accepted. It is especially noteworthy that the clinical significance of the influence of medical histories with different levels of risk on assessment was much more apparent in the case of the low-risk

The considerable evidence of the influence of expectancies in a wide variety of social situations and this evidence of the influence of past medical history on the assessment of at-risk infants supports a recommendation that assessments of these infants be completed without knowledge of past medical history. This is important in clinical as well as in research situations. Assessments conducted under these conditions would appear to be more valid indicators of the actual neuromotor status of these infants. This recommendation appears especially appropriate since it is relatively easily implemented and the disadvantages of such a measure is not apparent. Precautionary measures are of course necessary to provide the examiner with knowledge of medical contraindications which would limit or prohibit the use of some assessment procedures with individual infants. In these instances

measures to provide sufficient information to the examiner to ensure the safety of the infant during the examination must be instituted. Increased attention to the educational curriculum for physical therapy students regarding current perspectives of the limitations of prediction of neurodevelopmental outcomes in infants is also recommended. Such measures may, in time, encourage more accurate views of the complexity of etiological factors related to pediatric neurological and developmental problems.

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APPENDIX A

INFORMED CONSENT FORMS FOR PHYSICAL THERAPISTS AND FOR PARENTS OF INFANTS

CONSENT FOR PHYSICAL THERAPISTS PARTICIPATING IN THE STUDY

This study will investigate factors which affect the validity of assessments performed by physical therapists with at-risk infants. If you agree to participate you will be required to complete assessments of infants from videotapes using the Movement Assessment of Infants Examination. You will be required to participate in training sessions for use of this assessment tool prior to the actual data collection. Your participation will take one day of your time. You may withdraw from the study at any time during its course if you so desire. Your identity will be protected during any discussion, publication or presentation of the results of the study.

I consent to participate in the study of validity of the Movement Assessment Of Infants Examination. I understand that I may withdraw from the study at any time during its course.

signature of physical therapist subject _____

date_____

witness_____

date_____

CONSENT FOR PARENTS OF CHILDREN
WHO WILL BE VIDEOTAPED FOR PURPOSES OF THE STUDY
OF FACTORS WHICH INFLUENCE THE EVALUATIONS OF INFANTS
BY PHYSICAL THERAPISTS.

This study will investigate factors which may influence physical therapists' assessments of infants. If you agree to participate your child's assessment will be videotaped for use in this study. Physical therapists will view the videotape and complete an assessment of your child's movement abilities from their observations. Your child's identity will be kept confidential and the videotapes will be used only for teaching and research purposes.

signature of parent or guardian

date

_____

signature of witness _____

date_____

APPENDIX B

MEDICAL HISTORIES OF INFANTS

INFANT WITH ACTUAL LOW-RISK MEDICAL HISTORY VIDEOTAPED EXAMINATION AT FOUR MONTHS ADJUSTED AGE

MEDICAL HISTORY

Born by elective Cesarean section because of poor intrauterine growth on August 9 1988 at 32 weeks gestation to a 30 year old mother.

This infant was mildly depressed at birth. Apgars were 3 at one minute and 8 at 5 minutes. Infant was admitted to neonatal intensive care unit.

Birth weight was 1140 grams which was small for gestational

Developed respiratory distress syndrome - responded well to nasal continuous positive airway pressure for 36 hours and supplemental oxygen for 8 days. By second week was tolerating full feeds by mouth. Over subsequent 3 weeks established a good weight gain. pattern. Cranial ultrasound was normal. Overall course in neonatal intensive care unit was uneventful. This infant was discharged at 45 days of age on September 23 1988.

INFANT WITH ACTUAL HIGH-RISK MEDICAL HISTORY

VIDEOTAPED EXAMINATION AT FOUR MONTHS OF AGE

MEDICAL HISTORY

This 3780 gram infant was born Sept 23 1988 at term to a 25 year old mother. The mother had 2 spontaneous abortions previously. The infant was born by emergency Cesarean section after the mother presented with massive antipartum hemorrhage due to vasa praeva (blood vessels not developed normally in the placenta). Infant was very depressed at birth and looked hypovolemic (appeared to have low blood volume).

Apgar scores were 1 at 1 minute and 1 at 5 minutes.

Normal heart rate was not established until 15 minutes after delivery. This infant had a stormy immediate post natal period requiring extensive resuscitation and ventilatory support. Initial resuscitation included intubation, ventilation, administration of epinephrine, biocarbinate infusions, colloid infusions and a blood transfusion as soon as the infant was established in neonatal intensive care unit.

This infant developed acute tubular necrosis (kidney dysfunction), respiratory distress, and seizures.

Initial CNS examination showed marked hypotonia with deviated eyes and pinpoint pupils. Infant gradually became more active with normal reactive pupils. Initially had severe metabolic acidosis which was gradually corrected.

Extubation was accomplished on the evening of Sept 23, 1988.

After one day had good suck and gag reflexes and was responding to pain but was still significantly hypotonic. Having

occasional odd movement, query subtle siezures and was maintained on Phenobarbaritone. Developed bloody stools on basis of bowel ischemia due to hypotension. Was also in renal failure with oliguria (deficient secretion of urine).

EEG on September 30 showed a markedly abnormal recording.

CT scan report 28 Sept 1988

Cerebral white matter of decreased attenuation bilaterally to more of a degree than normal seen in a patient this age. The appearance may represent diffuse edema from ischemic/anoxic brain injury. Basal ganglia is of normal attenuation. Ventricles are of normal size and

Ct Scan October 1988

Some deterioration since the last examination, marked hypodensity of white matter now apparent, the basal ganglia and grey matter being of normal density. Findings consistent with marked changes in white matter on basis of asphyxia.

Neurological examination remained abnormal, prior to discharge, with significant head lag, increased muscle tone in lower limbs and intermittent clonus. Discharged on October 4 1988 at age 11 days on phenobarbitol (anticonvulsant).

APPENDIX C

MOVEMENT ASSESSMENT OF INFANTS EXAMINATION QUESTIONNAIRE TO PHYSICAL THERAPISTS

Scoring Sheet for

MOVEMENT ASSESSMENT OF INFANTS

with Four Month Profile

Name_____

Date of exam_____

Case number_____

Birth date_____

Examiner_____

Chronological age_____

Gestational age_____

Total Risk Score

Corrected age_____

MUSCLE TONE

Items 1-6, 9, and 10 should be coded by the scale below.

Code items 7 and 8 as explained in the instructions for these items in the manual.

0 - Item omitted

1 - Hypotonic

2 - Greater than hypotonic but less than normal

3 - Normal

4 - Greater than normal but less than hypertonic

5 - Hypertonic

6 - Fluctuating, variable

	Distribution Variation		Asymmetries	
	Upper	Lower	Left	Right
1 2 4 5 6___1.Consistency	____	____		
1 2 4 5 6___2.Extensibility	____	____		

1 2 4 5 6___3.Passivity _____ _____

1 2 4 5 6___4.Posture in Supine _____ _____

1 2 4 5 6___5.Posture in Prone _____ _____

1 2 4 5 6___6.Posture in Prone suspended_____ _____

3 4 ___7.Asymmetry

3 4 ___8.Distribution Variation

1 2 4 5 6___9.Summary of Tone _____ _____
Extremities

1 2 4 5 6___10.Summary of Tone _____ _____
Trunk

Primitive Reflexes

Items 1-12 should be coded by the scale below.

Code items 13 and 14 as explained in the instructions for these items in the manual.

0-Item omitted

1-Integrated or not elicited

2-Incomplete response

3-Complete response

4-Dominant

	Asymmetries	
	Left	Right
2 3 4 __1.Tonic Labrynthine Reflex in Supine	_____	_____
2 3 4 __2.Tonic Labrynthine Reflex in Prone	_____	_____
3 4 __3.Asymmetrical Tonic Neck Reflex-Evoked	_____	_____
3 4 __4. Assymmetrical Tonic Neck Reflex	_____	_____

-Spontaneous

3 4 ___	5.Moro	_____	_____
3 4 ___	6..Tremulousness	_____	_____
3 4 ___	7.Palmer Grasp..	_____	_____
4 ___	8.Plantar Grasp..	_____	_____
3 4 ___	9.Ankle Clonus	_____	_____
3 4 ___	10..Neonatal Positive Support..	_____	_____
3 4 ___	11Walking reflex	_____	_____
3 4 ___	12..Trunk Incurvation	_____	_____
3 4 ___	13..Asymmetry	_____	_____
3 4 ___	14..Summary of Primitive Reflexes	_____	_____

AUTOMATIC REACTIONS

Items 1-14 should be coded by the scale below.

Code items 15 and 16 as explained in the instructions for these items in the manual

0-Item omitted

1-Complete and consistent response

2-Incomplete or inconsistent response

3-Partial response

4-No response

		Asymmetries	
		Left	Right
2 3 4	__1.Head Righting-Lateral	_____	_____
2 3 4	__2.Head Righting-Extension	_____	_____
3 4	__3.Head Righting-Flexion	_____	_____
3 4	__4.Landeau	_____	_____
3 4	__5.Rotation In Trunk	_____	_____
3 4	__6..Equilibrium Reactions In Prone	_____	_____
	__7.Equilibrium Reactions In Sitting	_____	_____
	__8.Equilibrium Reactions In Vertical Suspension	_____	_____
	__9.Downward Parachute	_____	_____
	__10.Protective Extension-Forward	_____	_____
	___11.Protective Extension-Sideways	_____	_____
	___12.Protective Extension-Backwards	_____	_____
3 4	___13.Placing of Feet	_____	_____
3 4	___14..Placing of Hands	_____	_____
3 4	___15.Asymmetry	_____	_____
3 4	___14..Placing of Hands	_____	_____

Volitional Movement

Item 1-23 should be coded by the scale below

Code items 24 and 25 as explained in the instructions for these items in the manual.

0-Item omitted

1-Complete and consistent response

2-Incomplete or inconsistent response

3-Partial response

4-No response

		Asymmetries	
		Left	
4	__1.Hearing	_____	_____
3 4	__2.Visual Following	_____	_____
3 4	__3.Peripheral Vision	_____	_____
4	__4.Vocalization	_____	_____
2 3 4	___5.Head Centering	_____	_____
3 4	___6..Head Position-Anterior/Posterior	_____	_____
3 4	___7.Head Balance	_____	_____
3 4	___8.Active Weight Bearing Through Shoulders	_____	_____
3 4	___9.Open Hands	_____	_____
3 4	___10..Hands to Midline	_____	_____
	___11. Large Grasp	_____	_____
	___12..Small Grasp	_____	_____
	___13..Reaches Out	_____	_____

	___14.Combines	____	____
	___15.Transfers	____	____
4	___16.Back Straight in Sitting	____	____
4	___17.Active Use of Hips..	____	____
	___18.Rolling	____	____
	___19..Prone Progression	____	____
	___20.Sits When Placed	____	____
	___21.Comes To Sit	____	____
	___22.Coming to Stand..	____	____
	___23.Walking	____	____
3 4	___24.Asymmetry	____	____
3 4	___25..Summary of Volitional Movement	____	____

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QUESTIONNAIRE TO PHYSICAL THERAPISTS

1 How do you rate this infant's overall neuromotor developmental status?

( ) Normal

( ) Suspicious

( ) Abnormal

2 Do you feel it is warranted to review this infant's motor status at a further date?

( ) yes

( ) no

3 Do you feel that this infant requires intervertion by a physical therapist at this time?

( )yes

( )no

APPENDIX D

GUIDELINES FOR VIDEOTAPING INFANT EXAMINATIONS

GUIDELINES FOR VIDEOTAPING EXAMINATIONS

MOVEMENT ASSESSMENT OF INFANTS EXAMINATION

Muscle Tone Section

1. .Posture in supine - camera above baby and directly in line with head or feet.
2. Posture in prone - as above.
3. Posture in prone suspension - camera directly to the side of baby.

Primitive Reflex Section

1. Tonic labyrinthine reflex in supine.- camera above and directly at the head or feet of the infant.
2. Tonic labyrinthine reflex in prone - as above.
3. Asymmetrical tonic neck reflex - evoked - as above.
4. Asymmetrical tonic neck reflex -spontaneous - as above
5. Moro - camera above and directly behind therapist's shoulders.
6. Tremulousness no specific camera position.
7. Palmer grasp - camera on side of tested hand.
8. Planter grasp - camera on side of tested foot.
9. Ankle clonus - camera on side of tested foot.
10. Neonatal positive support - camera directly in front of baby.
11 Walking reflex - camera directly in front of infant.
12 Trunk incurvation (Galant) Camera directly above baby.

Automatic Reactions Section

1. Head righting - lateral - camera directly in front of baby.
2. Head righting - extension - camera directly to the side of baby.
3. Head righting - flexion camera - directly to the side of baby.
4. Landau reaction - camera directly to the side of baby.
5. Rotation in the trunk - camera directly at head of infant.
6. Equilibrium reactions in prone-camera above baby.
7 Placing of feet - camera directly beside baby.
8 Placing of hands- camera directly beside baby.

Volitional Movement Section

1. Hearing - Camera directly behind baby who is placed in sitting.
2. Visual following - Camera directly above head of baby.
3. Peripheral vision -camera above and directly at feet of infant.
4. Vocalization - no specific camera position.
5 Head centering - camera directly above child's head.
6 Head position - anterior / posterior camera directly to side of baby.
7 Head balance - as above.
8. Active weight bearing through shoulders - camera directly to side of child - video from both sides.
9. Open hands - no specific camera position.
10 Hands to midline - Camera directly above child -
11. Back straight in sitting - camera directly to side of baby.
12. Active use of hips - camera directly to side of infant.

APPENDIX E

INSTRUCTIONS TO PHYSICAL THERAPISTS PRIOR TO SCORING VIDEOTAPED INFANT EXAMINATIONS

INSTRUCTIONS TO PHYSICAL THERAPISTS PRIOR TO COMPLETING SCORING OF VIDEOTAPES USING MOVEMENT ASSESSMENT OF INFANTS EVALUATION

FIRST read the infant's prior medical history.

SECOND view the videotape once

THIRD Complete the movement assessment of infants evaluation you must rate all items on the sheet.

FOURTH complete the Questionnaire to Physical Therapists.

APPENDIX F

DATA MOVEMENT ASSESSMENT OF INFANTS RISK SCORES

MOVEMENT ASSESSMENT OF INFANTS RISK SCORES

TOTAL RISK SCORES

TOTAL RISK SCORES ASSIGNED BY PHYSICAL THERAPISTS ASSESSING INFANT WITH ACTUAL HIGH-RISK HISTORY WITH KNOWLEDGE OF ACTUAL HIGH-RISK HISTORY.

9, 13, 17, 18, 19, 19, 19, 19, 19, 21.

TOTAL RISK SCORES FOR PHYSICAL THERAPISTS ASSESSING INFANT WITH ACTUAL HIGH-RISK HISTORY WITH KNOWLEDGE OF FALSE LOW-RISK HISTORY.

7, 11, 12, 12, 13, 18, 19, 19, 19, 21.

TOTAL RISK SCORES ASSIGNED BY PHYSICAL THERAPISTS ASSESSING INFANT WITH ACTUAL LOW-RISK HISTORY WITH KNOWLEDGE OF ACTUAL LOW-RISK HISTORY.

1, 2, 2, 4, 4, 5, 6, 7, 7, 11, 16.

TOTAL RISK SCORES ASSIGNED BY PHYSICAL THERAPISTS ASSESSING INFANT WITH ACTUAL LOW-RISK MEDICAL HISTORY WITH KNOWLEDGE OF FALSE HIGH-RISK HISTORY

4, 4, 7, 8, 9, 9, 12, 14, 14, 26.

SECTION RISK SCORES - MUSCLE TONE

MUSCLE TONE SECTION RISK SCORES ASSIGNED BY PHYSICAL THERAPISTS ASSESSING INFANT WITH ACTUAL HIGH-RISK HISTORY WITH KNOWLEDGE OF ACTUAL HIGH-RISK HISTORY.

0, 5, 5, 5, 5, 5, 5, 5, 6, 7.

MUSCLE TONE SECTION RISK SCORES FOR PHYSICAL THERAPISTS ASSESSING INFANT WITH ACTUAL HIGH-RISK HISTORY WITH KNOWLEDGE OF FALSE LOW-RISK HISTORY.

1, 1, 2, 3, 4, 4, 5, 6, 6, 7,

MUSCLE TONE SECTION RISK SCORES ASSIGNED BY PHYSICAL THERAPISTS ASSESSING INFANT WITH ACTUAL LOW-RISK HISTORY WITH KNOWLEDGE OF ACTUAL LOW-RISK HISTORY.

0, 0, 0, 0, 0, 0, 0, 0, 1, 2, 3.

MUSCLE TONE SECTION RISK SCORES ASSIGNED BY PHYSICAL THERAPISTS ASSESSING INFANT WITH ACTUAL LOW-RISK MEDICAL HISTORY WITH KNOWLEDGE OF FALSE HIGH-RISK HISTORY

0, 1, 1, 2, 2, 2, 2, 2, 3, 5.

SECTION RISK SCORES - PRIMITIVE REFLEXES

PRIMITIVE REFLEXES SECTION RISK SCORES ASSIGNED BY PHYSICAL THERAPISTS ASSESSING INFANT WITH ACTUAL HIGH-RISK HISTORY WITH KNOWLEDGE OF ACTUAL HIGH-RISK HISTORY.

4, 4, 5, 5, 5, 6, 6, 7, 7, 8.

PRIMITIVE REFLEXES SECTION RISK SCORES FOR PHYSICAL THERAPISTS ASSESSING INFANT WITH ACTUAL HIGH-RISK HISTORY WITH KNOWLEDGE OF FALSE LOW-RISK

3, 4, 4, 5, 5, 5, 6, 6, 7, 7,

PRIMITIVE REFLEXES SECTION RISK SCORES ASSIGNED BY PHYSICAL THERAPISTS ASSESSING INFANT WITH ACTUAL LOW-RISK HISTORY WITH KNOWLEDGE OF ACTUAL LOW-RISK HISTORY.

1, 1, 1, 2, 2, 3, 3, 4, 4, 4, 7.

PRIMITIVE REFLEXES SECTION RISK SCORES ASSIGNED BY PHYSICAL THERAPISTS ASSESSING INFANT WITH ACTUAL LOW-RISK MEDICAL HISTORY WITH KNOWLEDGE OF FALSE HIGH-RISK HISTORY

2, 2, 3, 4, 4, 4, 6, 7, 8, 9.

SECTION RISK SCORES - AUTOMATIC REACTIONS

AUTOMATIC REACTIONS SECTION RISK SCORES ASSIGNED BY PHYSICAL THERAPISTS ASSESSING INFANT WITH ACTUAL HIGH-RISK HISTORY WITH KNOWLEDGE OF ACTUAL HIGH-RISK HISTORY.

0, 2, 3, 3, 3, 3, 4, 4, 5, 5,

AUTOMATIC REACTIONS SECTION RISK SCORES FOR PHYSICAL THERAPISTS ASSESSING INFANT WITH ACTUAL HIGH-RISK HISTORY WITH KNOWLEDGE OF FALSE LOW-RISK

1, 2, 2, 2, 3, 3, 3, 4, 4, 4.

AUTOMATIC REACTIONS SECTION RISK SCORES ASSIGNED BY PHYSICAL THERAPISTS ASSESSING INFANT WITH ACTUAL LOW-RISK HISTORY WITH KNOWLEDGE OF ACTUAL LOW-RISK HISTORY.

0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 2.

AUTOMATIC REACTIONS SECTION RISK SCORES ASSIGNED BY PHYSICAL THERAPISTS ASSESSING INFANT WITH ACTUAL LOW-RISK MEDICAL HISTORY WITH KNOWLEDGE OF FALSE HIGH-RISK HISTORY

0, 0, 0, 0, 0, 0, 0, 1, 1, 4.

SECTION RISK SCORES - VOLITIONAL MOVEMENT

VOLITIONAL MOVEMENT SECTION RISK SCORES ASSIGNED BY PHYSICAL THERAPISTS ASSESSING INFANT WITH ACTUAL HIGH-RISK HISTORY WITH KNOWLEDGE OF ACTUAL HIGH-RISK HISTORY.

2, 3, 3, 4, 4, 4, 4, 4, 4, 4.

VOLITIONAL MOVEMENT SECTION RISK SCORES FOR PHYSICAL THERAPISTS ASSESSING INFANT WITH ACTUAL HIGH-RISK HISTORY WITH KNOWLEDGE OF FALSE LOW-RISK

1, 1, 1, 3, 3, 3, 4, 5, 5, 6,

VOLITIONAL MOVEMENT SECTION RISK SCORES ASSIGNED BY PHYSICAL THERAPISTS ASSESSING INFANT WITH ACTUAL LOW-RISK HISTORY WITH KNOWLEDGE OF ACTUAL LOW-RISK HISTORY.

0, 0, 1, 1, 1, 2, 3, 3, 4, 4, 6.

VOLITIONAL MOVEMENT SECTION RISK SCORES ASSIGNED BY PHYSICAL THERAPISTS ASSESSING INFANT WITH ACTUAL LOW-RISK MEDICAL HISTORY WITH KNOWLEDGE OF FALSE HIGH-RISK HISTORY

1, 2, 2, 2, 2, 3, 4, 4, 4, 8.